2010-06-01

Breastfeeding and Mothers with Chronic Health Conditions

Blanche Landis PhD
University of San Diego

UNIVERSITY OF SAN DIEGO

Hahn School of Nursing and Health Science

DOCTOR OF PHILOSOPHY IN NURSING

BREASTFEEDING AND MOTHERS WITH CHRONIC HEALTH CONDITIONS

by

Blanche Landis

A dissertation presented to the

FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE

UNIVERSITY OF SAN DIEGO

In partial fulfillment of the

requirements for the degree

DOCTOR OF PHILOSOPHY IN NURSING

June/2010

Dissertation Committee

Anita Hunter, PhD, RN, FAAN, Chairperson

Jane Georges, PhD, RN

Kathy James, PhD, RN

ABSTRACT

Breastfeeding and Mothers with Chronic Health Conditions

Breastfeeding may be most beneficial for women with specific chronic illness and may decrease the risk or prevent those illnesses from developing in their children. This study examined the initiation and duration rates of mothers identified as having asthma, hypertension, and diabetes; differences between the three groups in their efforts to breastfeed, and associations between determinants/outcomes of breastfeeding and behavioral beliefs, normative beliefs, and perceived control of mothers using Ajzen's Theory of Planned Behavior (TPB).

A retrospective quantitative methodology was used to compare rates of initiation and duration, the differences between the three groups, and correlations of determinants/outcomes to the constructs of the TPB. A qualitative element identified continuation/discontinuation themes and was used to give further insight into the mothers' breastfeeding decisions.

Fifty-three mothers, with asthma, hypertension or diabetes prior to the pregnancy were recruited into the study. The Breastfeeding Attrition Predictor Tool (BAPT), a 52-item valid and reliable Likert scale instrument was used to assess the mothers' behavior and normative beliefs and perceived control regarding breastfeeding. The BAPT also provided a section for demographic information. Descriptive statistics, ANOVA, and correlations were used to analyze the data.

Findings included a breastfeeding initiation rate of 100 % for all groups of mothers and a duration rate that exceeded the 2010 Healthy People recommendations. Mothers with asthma were found to higher Positive Breastfeeding Sentiment (PBS) than the other two groups. Women who endured a cesarean delivery reported lower levels of PBS. Women who breastfed their last child longer reported higher levels of Breastfeeding Control (BFC) along with those who reported more positive breastfeeding experiences with their last child. The recurring theme for continuing to breastfeed was the health of the baby, while discontinuing was self weaning of the baby or goals were achieved.

Mothers with chronic health conditions face challenges of managing their chronic illness while dealing with all of the changes associated with pregnancy and breastfeeding. A better understanding of their efforts to breastfeed may help health care providers to develop, implement, and evaluate programs that support this vulnerable group of mothers.

DEDICATION

I would like to dedicate this dissertation to:

My daughter Meghan E. Murphy

A lovely human being, who is a courageous, intelligent, compassionate young woman,

and a blessing to my life. She also taught me how to breastfeed.

My mother and father

Claude and Annie Landis

whose ethic of work and care,

and abiding faith in education formed the bases for my many journeys.

My brothers (Burley, Jesse, James, Walter) and sisters (Frances, Hazel, Margaret, Agnes)

and my niece Anna Lea for their continuing love, support, and encouragement.

The little things mean a great deal.

ACKNOWLEDGEMENTS

A heartfelt thanks to my chairperson, Dr. Anita Hunter, for her extraordinary intellect, encouragement, and support though out a very long process with many challenges. Additional gratitude to committee member Dr. Jane Georges, whose patience and encouragement meant so much to me, and committee member Dr. Kathy James who generously gave her time and support to help me complete this process.

A special thanks to Dr. Patricia Roth, who always inspired and was the first to tell me that I could write.

Thank you to Gini Baker and the 'sisterhood' for sharing so much information and insights about breastfeeding, to Maureen Hopson and Nicole Klinicke for their support and help in recruiting, and the breastfeeding mothers who shared their experiences of breastfeeding with chronic illness.

For his statistical knowledge and ongoing support and encouragement, thank you to Jordan Willoughby. Enormous gratitude is extended to Dr. Donna Agan for her knowledge of statistics, APA formatting, the dissertation process, and support to finish up. A very special thanks to Dr. Suzanne Robertson for sustained support and encouragement. In addition, I would like to give a big *thank you* to all of my colleagues and friends.

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Chapter 1

Introduction

The health benefits of breast milk and breastfeeding have been well documented. Increasing the initiation and duration of breastfeeding in the United States has been identified as an important public health priority. Specific goals of Healthy People 2010 (Healthy People, 2005) are to increase quality and years of life, and to eliminate health disparities within our society. Breastfeeding has been identified as one of the objectives to achieve the goals of Healthy People 2010.

Much is known about breastfeeding initiation and duration rates for several different groups of mothers. Demographic research has identified considerable differences based on age, marital status, income, education, region, employment status, ethnicity, breastfeeding experience, and participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Program (Bai, Middlestadt, Peng, & Fly, 2009; Bently, Dee, & Jensen, 2003; Falceto, Giugliani, & Fernandes, 2004a; Fein, Mandal, & Roe, 2008; Flower et al., 2008; Hannan, Li, Benton-Davis, & Grummer-Strawn, 2005; Kong & Lee, 2005; Li, Darling, Maurice, Barker, & Grummer-Strawn, 2005; Rojjanasrirat, 2004; Sparks, 2009; Tiedje, 2001; Wambach & Koehn, 2004). More research is being done on babies who are premature, with low birth weight, poor suck

ability, and other medical conditions that might interfere with breastfeeding or ingestion/digestion of breast milk (Callen, Pinelli, Atkinson, & Saigal, 2005; Cricco-Lizza, 2009; Spatz, 2006). Research has also shown the importance of provider education, perinatal medical and hospital procedures, baby friendly hospital status, and mother's access to breastfeeding information and support (Callen et al., 2005; Gagnon, Leduc, Wagnorn, Yang, & Platt, R., 2005; Miller, Cook, Brooks, Heine, & Curtis, 2007; Rosen, Krueger, Carney, & Graham, 2008; Shealy, Ruowei, Benton-Davis, & Grummer-Strawn, 2005; Taveras et al., 2003). However, little is known about mothers with chronic health conditions such as asthma, hypertension, and diabetes and their breastfeeding experiences.

The purpose of this study was to determine the initiation and duration rates of mothers identified as having asthma, hypertension, and diabetes; to examine differences between asthmatic, hypertensive, and diabetic mothers in their efforts to breastfeed; and to identify possible associations between determinants/outcomes of breastfeeding and behavioral beliefs, normative beliefs, and perceived control of mothers with asthma, hypertension, and diabetes. It has been hypothesized that if women with these chronic health states would breastfeed, the health of their children would be significantly improved and there could be a decrease in the incidence of these children also acquiring the chronic health condition (Agency for Healthcare Research & Quality, 2007; Horta, Bahl, Martines, & Victora, 2007; Kemp & Kakakios, 2004; Kull, Wickman, Lilja, Nordvall, & Pershagen, 2003; Martin, Ness, Gunnell, Emmet & Smith, 2004; Oddy, 2004; Oddy et al., 2004; Singhal, Cole, & Lucas, 2001; Stuebe, Rich-Edwards, Willett, Manson, & Michels, 2005).

Background and Significance

Until the late 1800s, breastfeeding was the predominant means or norm of providing nutrition to infants. Alternative forms of nutrition, most often cow's milk, were used in the late 1800s. For many mothers, not breastfeeding and the use of wet nurses was associated with affluence or elitism. Other mothers did not breastfeed due to outside employment Increases in infant diseases and mortality were identified with not breastfeeding and physicians encouraged mothers to breastfeed. However, the development of infant formula in the 1850s and physician prescriptive authority over distribution of the formula increased its desirability and use (Lauwers & Swisher, 2005; Riordan, 2004; Thulier, 2009; Wolf, 2003).

Deliveries, once done at home, often among female friends, family, and attendants, moved to more sterile, regulated hospitals. Mothers were separated from their babies for longer periods of time, thus decreasing opportunities for breastfeeding. Use of cow's milk or infant formula based on cow's milk continued to increase. Although many physicians made an effort to educate and promote breastfeeding, others actively promoted formula as a more modern and scientifically based form of nutrition (Lauwers & Swisher, 2005; Riordan, 2004; Thulier, 2009; Wolf, 2003).

The most significant decline in breastfeeding occurred between the late 1940s and early 1970s when more mothers sought outside employment, and large numbers of people moved from rural to urban areas. As a result, the number of women who could model breastfeeding had decreased (Lauwers & Swisher, 2005; Riordan, 2004; Rojjanasrirat, 2004; Thulier, 2009; Walker, 2007; Wolf, 2003). Infant formula was promoted and dispensed by infant formula corporations and government assistance

programs (such as WIC). Local, national, and international reactions to low breastfeeding rates and promotion of formula prompted the formation of the La Leche League, development of the World Health Organization (WHO) International Code of Marketing of Breast-Milk Substitutes, the Baby Friendly Hospital Initiative, legislative changes to the education content in the WIC Programs, and an examination of research priorities in the use of federal funds for breastfeeding/lactation/infant nutrition (Brown, Bair, & Meier, 2003; Lauwers & Swisher, 2005; Riordan, 2004)

In 1989, the Child Nutrition and WIC Reauthorization Act required that a part of the budget go towards increasing breastfeeding rates for their participants. The act further stipulated that state health departments establish a breastfeeding promotion coordinator to increase breastfeeding rates (Lauwers & Swisher, 2005; Riordan, 2005; Tuttle, 2000; U.S. Government Accounting Office, 2006a, 2006b; Weimer, 2001). Even though rates have increased, they are still below the rates for non-WIC participants and for the goals of 2010 Healthy People recommendations. Participation in WIC remains the strongest predictor for not initiating or continuing breastfeeding. Nearly fifty percent of infants in this country participate in the WIC program. Initiation rates are approximately sixty percent at initiation and approximately twenty percent at six months (McCann, Baydar, & Williams, 2007; Ryan & Zhou, 2005; U.S. Department of Agriculture, Food & Nutrition Service, 2008). Lawrence (2006) suggested that part of the problem may the very low percentage of funds for breastfeeding initiatives within the WIC budget. In an effort to determine the use of other federal funding for projects under breastfeeding/lactation/ infant nutrition, Brown et al. (2003) found that of the $40 million allocated for 362 projects, only six projects would have a direct impact on the goals of

Healthy People 2010 to increase the initiation and duration rates for breastfeeding. Additional research has identified other barriers/obstacles to breastfeeding.

Identified barriers/obstacles to breastfeeding. Initiation and duration rates for breastfeeding have been found to be low for teenagers, low income mothers, low-income rural mothers, lower educated mothers, mothers in the southern part of the United States, mothers participating in the WIC Program, mothers who deliver at non-Baby Friendly Hospitals, and mothers who experience a cesarean delivery (Bently et al., 2003; Chalmers et al., 2009; Hannan et al., 2005; Hong, Callister, & Schwartz, 2003; Kong & Lee, 2005; McCann et al., 2007; Tiedje, 2000; U.S. Department of Agriculture, Food, & Nutrition Service, 2008; Wambach et al., 2004). Continuation or duration of breastfeeding has been found to be affected by perceived insufficient milk supply, latch problems, fatigue, medication, post partum depression, lack of family or social support, employment or school, and pain (Gatti, 2008; Hale, 2006; Hill, Aldag, Zinaman, & Chatterton, 2007; Lagoy, Joshi, Cragan, & Rasmussen, 2005; McCann et al., 2007; Taveras et al., 2003).

Using focus groups and a convenience sample of 14 pregnant adolescents, Wambach et al. (2004) found a common thread of ambivalence and uncertainty expressed regarding breastfeeding. Although the adolescents expressed knowledge of the benefits of breastfeeding, they also described pain, complexity of breastfeeding, and public exposure as barriers. Wambach and colleagues suggested that pregnant adolescents receive education on decision making about breastfeeding and that further interventions examine how breastfeeding could be better promoted and supported in this group. Barton (2001) examined the feeding practices of 52 low-income rural mothers in a descriptive/ exploratory study on infants at risk for failure to thrive. While health professionals have

influence on initiation to breastfeed, Barton found that family, especially grandmothers, have greater influence afterwards. The need for mother and grandmother education and support was emphasized in her study.

Although gender was not identified, a mail survey of 2,557 respondents on breastfeeding from different regions of the United States found different rates and a variation of opinion on breastfeeding (Hannan et al., 2005). The survey was part of the Healthstyles survey that contained questions about breastfeeding opinions. Those questions had four themes that included breastfeeding knowledge, public approval, public support of workplace policies, and starting complimentary foods and weaning. People from the Pacific, West North Central, West South Central, and Mountain regions had more knowledge about breastfeeding than other regions. Public approval for breastfeeding was highest in the Mountain, New England, and Pacific regions. Support of workplace polices that supported breastfeeding was generally similar across the regions. In terms of duration, people in the Pacific, Mountain, and East North Central regions had the most positive perceptions about continuing to breastfeed. The researcher noted that even though the public believes that breastfeeding is healthier, there was a lack of understanding about the consequences of not breastfeeding. Cohen, Lange, and Slusser (2002) found that fathers have the strongest influence on whether the mother breast feeds. Their study was based on responses from 128 men and their partners who participated in the Fathering Program at the Los Angeles Department of Water and Power through a corporate breastfeeding promotion program. They suggested that more attention be paid to the social network of the mother rather than demographics. In a study on race/ethnicity and immigration status and breastfeeding of 1,829 women in

eastern Massachusetts, Celi, Rich-Edwards, Richardson, Kleinman, and Gillman (2005) found that immigration status and education were significant in breastfeeding decision making. Greater acculturation had a negative effect on breastfeeding, and minority breastfeeding continued at lower rates than for Caucasians.

Concerns of nipple pain and soreness, problems of infant sucking or latching on, not producing enough milk, and going back to school or work were identified by Taveras et al. (2003) as barriers to initiation and duration of breastfeeding. Their study, a prospective cohort study of 1163 mother-newborn pairs in a large HMO of low risk mothers and infants, found that mothers who received support from their health care providers and nurse consultants were twice as likely to continue breastfeeding at twelve weeks, compared to those mothers who did not receive encouragement to breastfeed. Taveras et al., along with Hatton et al. (2005), identified post partum depression as a barrier to breastfeeding when untreated. In a study of 1,745 mothers in Australia, Henderson, Evans, Straton, Priest, and Hagan (2003) found that post partum depression had a negative impact on breastfeeding duration. The mothers in the study were from high income households, were well educated, over 25 years of age, in stable relationships and had vaginal deliveries.

Going back to school or work has been identified as one the strongest predictors of stopping breastfeeding (Taveras et al., 2003). Employment was also the focus of Rojjanasrirat's (2004) study of 50 working women and their breastfeeding experience. The data from open-ended questionnaires affirmed the value of prenatal education and the importance of having support, maintaining a positive attitude, and of having a strategy or plan to continue to breastfeed when a mother goes back to work. She found

that workplace policies did make a difference for mothers who wanted to continue to breastfeed and work.

Maternal confidence and infant preferences were identified as barriers in Ertem, Votto, and Leventhal's (2001) longitudinal study on breastfeeding of 50 WIC Program participants. The mothers in this study experienced similar barriers as described above in addition to a lack of confidence about breastfeeding and lack of understanding about infant feeding preferences. Those concerns continued to be identified in the U.S. Department of Agriculture, Food and Nutrition Service (2008) report on WIC participants and program characteristics. Hong et al. (2003) found that increasing mothers' confidence had a positive impact on initiation and duration of breastfeeding. This phenomenology study of 20 primiparous mothers found that attitudes and behaviors of nurses that were considered non-supportive were considered barriers to breastfeeding by the mothers. Mantha, Davies, Moyer, and Crowe (2008) found in their study of 74 Canadian mothers, that nurses needed to determine the mothers' level of confidence in breastfeeding and give support and information based on the mother's cultural background and confidences level. Increasing mothers' confidence led to increased levels of breastfeeding. Additionally, mothers wanted more information and support across the continuum of care, from prenatal to postpartum care.

Hospitals that follow the Baby Friendly Initiatives that support, protect, and promote breastfeeding, using the ten steps to successful breastfeeding, had higher rates of initiation and duration of breastfeeding (Philipp, Malone, Cimo, & Merewood, 2003), even for low income black mothers (Merewood et al., 2007). Gagnon et al.'s (2005) study of 564 Canadian mother-infant pairs and interviews of self-selected post partum

nurses found that hospital or unit policies, and perceptions of physicians or nurses who believed that supplementation of breastfeeding benefited mothers, decreased successful initiation and duration of breastfeeding. Concerns about mother fatigue or mother illness persuaded nurses to give supplemental feedings rather than support mother infant contact.

Callan et al.'s (2005) qualitative, longitudinal study used secondary analysis of a previously randomized controlled trial of 64 mothers to identify mothers' perception of barriers to breastfeeding for their very low birth weight infants. They found that some barriers had different time lines. Barriers included mothers' perception of a compromised baby, development of poor breastfeeding techniques, emotional stress of having a very low birth weight baby, low milk volume, nipple and breast problems, and complementary feedings. They emphasized interventions that targeted time sensitive barriers such as pumping in the beginning and having a good support system as important. Nursing support was also found to be very important to new mothers living with chronic illness such as fibromyalgia. In a qualitative study by Schaefer (2004) through interviews and stories, nine mothers described muscle soreness, stiffness, pain and the need for medication as barriers to breastfeeding.

The reasons that mothers initiated and continued to breastfeed. It is not only important to understand the barriers/obstacles to breastfeeding, but also the reasons mothers identify for initiating and continuing breastfeeding. In a study done by Brodribb, Fallon, Hegney, and O'Brien (2007), a survey of 562 mothers' responses starting with the most frequent listed reasons to breastfeed included: (a) breast milk is better for the baby, (b) breastfeeding enhances my baby's immunity, (c) breastfeeding is more convenient, (d) breastfeeding helps prevent allergies in my baby, (e) breastfeeding is

cheaper, (f) I enjoy breastfeeding, (g) breastfeeding is the right thing to do, (h) I don't want to have to mix formula/sterilize bottles, (i) breastfeeding helps you to lose weight, (j) my partner wanted me to breastfeed, (k) my mother breastfed, (l) breastfeeding enhances intelligence, (m) a nurse advised me to breastfeed, (n) my mother advised me to breastfeed, (o) a doctor advised me to breastfeed, and (p) breastfeeding is fashionable. Brodribb et al. grouped the responses into four categories: (a) mother related reasons, (b) health effects for the baby, (c) moral/family influences, and (d) advice from others.

A national study of attitudes of 874 WIC participants found very similar reasons for breastfeeding with the addition of bonding. Mothers agreed with the following statements in order of importance: (a) breastfeeding brings a mother closer to her baby, (b) breastfeeding helps protect the baby from diseases, (c) breast milk alone gives a new baby all he/she needs to eat, (d) breastfed babies are healthier than bottle fed babies, (e) breastfeeding helps women lose weight, (f) breastfeeding is easier than bottle feeding, (g) breastfeeding will protect your baby against ear infections, (h) breast pumps are easy to use, and (i) breastfeeding will protect your baby against diarrhea (McCann et al., 2007). The above listings may underscore the significant gains made in education about the benefits of breastfeeding compared to an earlier study of 6,733 mother's breastfeeding behavior from the 1995 National Survey of Family Growth done by Taylor, Risica, and Cabral (2003) on why first times mothers did not breastfeed in the United States. The response most cited for not initiating breastfeeding was that mothers preferred to bottle feed, with physical or medical problems listed as the second reason for not breastfeeding. Physical or medical problems were also the second most commonly listed reason for not

continuing breastfeeding. Half of the mothers who listed physical or medical problems also indicated insufficient milk as a difficulty.

Chronic Health Conditions and Breastfeeding

Breastfeeding may be most beneficial for women with specific chronic illness and may decrease the risk or prevent those illnesses from developing in their children (Agency for Healthcare Research & Quality, 2007; Kemp & Kakakios, 2004; Kull et al., 2002; Martin et al., 2004; Oddy, 2004; Oddy et al., 2004; Singhal et al., 2001; Stuebe et al., 2005). Breast milk has been found to decrease the risk of developing type 1 diabetes in children (Agency for Healthcare Research & Quality, 2007; Jackson, 2004; Ziegler, Schmid, Huber, Hummel, & Bonifacio, 2003); as well as particular childhood cancers, respiratory infections, ear infections, dental caries, sudden infant death syndrome, and infant mortality (Agency for Healthcare Research & Quality, 2007; American Academy of Pediatrics, 2005; California Department of Health Services, 2004; Chen & Rogan, 2004). Breast milk may also decrease the incidence of obesity, asthma, hypertension (Agency for Healthcare Research & Quality, 2007; American Academy of Pediatrics, 2005; Bogen, Hanusa, & Whitaker, 2004; California Department of Health Services, 2004; Horta et al., 2007; Kemp & Kakakios, 2004; Lauwers & Swisher, 2005; Riordan, 2004; Singhal et al., 2001), and duration of breastfeeding may have a positive effect on neuropsychological development of young children (Horta et al., 2007; Plagemann et al., 2005).

Mothers who have breastfed have a lower incidence of breast, ovarian, and cervical cancer, and a lower risk of developing Type 2 diabetes (Agency for Healthcare Research & Quality, 2007; American Academy of Pediatrics, 2005; Blincoe, 2005;

California Department of Health Services, 2004; Stuebe et al., 2005). An increased risk for post partum depression may be associated with not breastfeeding or early attrition of breastfeeding (Agency for Healthcare Research & Quality, 2007; Henderson et al., 2003). Mothers with chronic health conditions are also at greater risk for emergency Cesarean delivery (Linton & Peterson, 2004). The effects of anesthesia, pain, and risk for separation of the baby from mother may be another obstacle/barrier that many women with chronic health conditions face in regards to breastfeeding (Karlström, Engström-Olofssen, Norbergh, Sjöling, & Hildingsson, 2007).

Healthy People 2010 goals state that 75% of infants should be breastfed at birth, 50% at six months, and 25% at 12 months. Recommendations for exclusive breastfeeding are 40% at three months, and 17% at six months. In 2008, 74.2% of mothers initiated breastfeeding, 43.1% were breastfeeding at 6 months and 21.4 % were breastfeeding at 12 months. The percentage of exclusive breastfeeding was set at 31.5 % at 3 months, and 11.9 % at 6 months. Those goals have not been met by women without chronic illness (Haynes, 2005; Centers for Disease Control & Prevention, 2008a). It has been unclear what the rates of breastfeeding initiation and duration are for women with asthma, hypertension, and diabetes.

Asthma. The Working Group Report on Managing Asthma During Pregnancy under the National Asthma Education and Prevention Program (NAEPP; 2004) reported that more than 20 million people have asthma. Asthma affects approximately 4% to 9% of pregnant women and can cause serious medical conditions that may complicate pregnancy (Kwon, Belanger, & Bracken, 2003). Asthma is one of the leading causes of hospitalization and death in children. Prevalence rates are increasing about 5% each

year, to over 17 million in 1998 (Oddy, 2004; Oddy & Pete, 2003; Weiss, 2001). Some complications for mothers with asthma may include low-birth-weight babies, preeclampsia, premature birth, and prenatal mortality (Holcomb, 2005). Appropriate and aggressive management of asthma may prevent exacerbations that increase the risk of poor pregnancy outcomes (Holcomb, 2005; National Asthma Education & Prevention Program, 2004; Scott, Mostyn, & Greater Glasgow Breastfeeding Initiative Management Team, 2005; Sheiner, Mazor, Levy, Wiznitzer, & Bashiri, 2005). With one exception (Sears et al., 2002), researchers agree that breastfeeding, particularly exclusive breastfeeding prevents or decreases the risk of infants and children developing asthma (Agency for Healthcare Research & Quality, 2007; Kemp & Kakakios, 2004; Kull et al., 2002; Oddy, 2004; Oddy & Pete, 2003; Oddy et al., 2004). Yet little has been known about breastfeeding attitudes, beliefs, or sense of control for mothers with Asthma.

Hypertension. Nearly 50 million people have hypertension in the United States. Approximately 5% to 8% of pregnant women experience chronic hypertension. Hypertension can cause serious medical conditions that may complicate pregnancy. Some complications may include low-birth-weight babies, fetal loss, preeclampsia and placental abruption (Flack, Peters, Mehra, & Nasser, 2002; National Heart Lung & Blood Institute, 2001; Roberts, Algert, Morris, Ford, & Henderson-Smart, 2005). Children under the age of 10 rarely experience primary hypertension which accounts for about 10% to 15% of childhood hypertensive cases. Hypertension in children is often associated with obesity (Flack et al., 2002). Singhal et al.'s (2001) study of 926 pre-term infants showed significantly lower blood pressure for those children at the age of 13 to 16 years of age who received breast milk. Martin et al.'s (2004) study of blood pressure in

4,763 children at age 7 ½, found lower blood pressure in children who were born full term and breastfed. He further noted the public health implications for lowering population blood pressure. Mothers with hypertension, pregnancy induced or chronic, were identified in a study done by Hall et al. (2002) to be at risk for breastfeeding cessation before ten days. Yet, little has been known about breastfeeding attitudes, beliefs, or sense of control for this group of mothers.

Diabetes. Diabetes is a debilitating, and costly condition currently effecting over 20 million people in the U.S. Diabetes may occur as a result of genetic influences, autoimmune responses, obesity, and pregnancy (gestational diabetes). Gestational diabetes occurs during pregnancy and develops into type 2 diabetes for 2% to 5% of women after pregnancy. Within 5-10 years, 20% to 50% of women with gestational diabetes may develop type 2 diabetes (Centers for Disease Control & Prevention, 2005). Projections are that, by 2055, 300 million people worldwide will be affected by diabetes (Hjelm, Mufunda, Nambozi, & Kemp, 2003). Over 9 million women or 8.8% of all women over 20 years of age have diabetes (Centers for Disease Control & Prevention, 2005). In 2005, 1.5 million new cases of diabetes were diagnosed in the U.S. for people 20 years and older, with increasing numbers of children and adolescents being diagnosed with Type 2 diabetes (Gahagan, Silverstein, American Academy of Pediatrics Committee on Native American Child Health, & American Academy of Pediatrics Section on Endocrinology, 2003). The American Academy of Pediatrics recommended breastfeeding in clinical guidelines for the treatment and prevention of diabetes II in children (American Academy of Pediatrics, 2005).

Approximately 4% to 14% of pregnant women have diabetes and approximately 5% to 10% of those also have chronic hypertension (Gilbert, 2007; Lethbridge-Cejku, Schiller, & Bernadel, 2004). Pregnancy can be complicated by diabetes that is poorly controlled before pregnancy and in the first trimester. Complications such as major birth defects can occur in 5% to 10% of those pregnancies, while spontaneous abortions can occur in 15% to 20% of the pregnancies (Centers for Disease Control & Prevention, 2006a; Clausen et al., 2005; Jovanovic et al., 2005; McElduff et al., 2005). Women with diabetes are at greater risk for delivering by cesarean route (Gilbert, 2007). A large-for-gestational-age baby may be the result of poorly controlled diabetes in the second and third trimesters of pregnancy (Centers for Disease Control & Prevention, 2005). Clausen et al. (2005) found similar results with greater risks for poor outcomes in 61 women with type 2 diabetes. However, duration of breastfeeding was found to have a positive effect in decreasing risk of developing type 2 diabetes in a study of 5145 cases under the Nurses' Health Study (NHS) and 1,132 cases under the Nurses' Health Study II (NHS II) done by Stuebe et al. (2005).

In contrast to asthma and hypertension, some knowledge exists about diabetic mothers and breastfeeding. In terms of initiation of breastfeeding for type 2 and gestational diabetes, Simmons, Conroy, and Thompson (2005) found in a study of 30 women with type 2 diabetes and 373 with gestational diabetes that women with type 2 diabetes had lower rates of breastfeeding. That study found that breastfeeding on discharge from the hospital was associated with breastfeeding as the first feed, delivery by caesarean and higher APGAR scores. In a study of long-term breastfeeding in 102 women with type 1 diabetes, Stage, Nørgård, Damm, and Mathiesen (2006) found those

mothers to have similar breastfeeding initiation rates and four month duration rates as the background population. Exclusive breastfeeding at four months was related to higher educational levels and prior breastfeeding experience. Those mothers stopped breastfeeding because of perceived milk insufficiency and other nursing problems.

The impact nurses and healthcare providers have on pregnant women with type 1 diabetes was described by Berg (2005) in a qualitative study of how 18 women experienced their diabetes and handled the challenges of their pregnancy. The women described feelings of wanting to be responsible and also wanting to surrender responsibility to healthcare providers. They also described interactions with healthcare providers as a supportive resource and as controlling. As in Fenwick, Barclay, and Schmied's (2001) study, Berg's study was not specifically about breastfeeding. However, it gives insight into perceptions and interactions that may well carry over into breastfeeding activities.

Contraindication to breastfeeding or breast milk. Infants who have intestinal lactase deficiency, phenylketonuria (PKU) need specialized diets that require total or partial supplementation with specialized formula (American Academy of Pediatrics, 2005; Lauwers & Swisher, 2005; Riordan, 2005). Breastfeeding is not recommended for mothers with active tuberculosis, positive for human T-cell lymphotropic virus type 1 or II, HIV, and herpes simplex lesions on their breast (Riordan, 2005). Infants with severe hyperbilirubinemia may need brief supplements of formula (Lawrence & Lawrence, 2005). While it is recommended that mothers not smoke or have limited alcohol consumption, it is not contraindicated in breastfeeding (Riordan, 2005). Mothers who are receiving antimetabolites, chemotherapeutic agents, diagnostic/therapeutic radioactive

isotopes, class D medications, or 'street drugs', should not breastfeed until the elements or medications have cleared their breast milk (AAP, 2005; Lauwers, 2005; Lawrence, 2005; Riordan, 2005).

Medications in breast milk._Nearly 60% of pregnant women use a prescriptive drug during their pregnancy (Andrade et al., 2004). Those who have chronic health conditions are more likely to use category D or X drugs during pregnancy (Riley et al., 2005). Percentages are less clear for lactating women. Pediatricians and lactation consultants receive many questions about drugs and breastfeeding. Too often a prescribed medication will not be taken or discontinued and breastfeeding may stop even when a medication is considered safe (Hale, 2006; Lagoy et al., 2005). This becomes even more important for women with chronic health problems who may require a daily medication regime to control their health problem.

Medication safety is divided into categories of A, B, C, D, and X. Categories A and B are generally considered safe for pregnant women, with some exceptions to first trimester. Category C is evaluated on the basis of benefit to risk. Category D has a fetal risk, however, this category is also evaluated on the benefit to risk ratio. Category X is identified for those meds in which the risks outweigh benefits (Hale, 2006; Lawrence & Lawrence, 2005). Hale (2006) used an additional method of identifying medications for lactating mothers as L1 (safest), L2 (safer), L3 (moderately safe), L4 (possibly hazardous), and L5 (contraindicated). In evaluating transfer of drugs into humans, Lawrence and Lawrence (2005) and Hale suggested that the infant's age and stability, and medical condition of the mother be evaluated. Use of drugs in lactation is based on protein binding, molecular weight, passage to the brain, concentration in maternal

plasma, and theoretical and relative infant dose (Hale, 2006; Lagoy et al., 2005; Lawrence & Lawrence, 2005). Hale listed amiodarone, antineoplastic agents, chloramphenicol, ergotamine, gold salts, Lithium, phenindioine, tadiopharmaceuticals, retinoids, tetracyclines, and pseudoephedrine as usually contraindicated in lactation. Herbal drugs that were also contraindicated in breastfeeding are aloe, buckthorn bark and berry, cascara sagrada bark, coltsfoot leaf, extract of senna leaf, peppermint, and caraway oil, kava kava, petasites root, Indian snakeroot, rhubarb root, senna leaf, uva yrsi, blue cohosh, sage, jin bu huan, germander, comfrey, mistletoe, skullcap, margosa oil, mate tea, gordolobo yerba tea, pennyroyal oil.

This study was not about the use of medications in pregnancy and breastfeeding. However, the impact on mothers with asthma, hypertension, or diabetes who wish to breastfeed may be greater than for mothers without those conditions. This may be due to possible medication complications and contraindications in breastfeeding or lack of understanding or information about which medications are safe.

NAEPP's (2004) working report suggested using a stepwise approach to manage asthma during pregnancy and lactation. For quick relief a short acting bronchodilator was recommended with corticosteroids or short acting beta2-agonists for mild intermittent asthma. To control mild persistent asthma, the group recommended low dose corticosteroids and long acting beta2-agonists or medium dose inhaled corticosteroids, or medium dose inhaled corticosteroids. For recurring severe exacerbations a medium dose of inhaled corticosteroid and long acting inhaled beta2-angonists were recommended. For severe persistent asthma, the group recommended high dose inhaled corticosteroids and long acting inhaled beta2-agonists and if needed corticosteroid tablets or syrup.

Uncontrolled asthma might increase the risk of low birth weight in infants, preterm birth, preeclampsia, and perinatal mortality, so it is important for mothers to maintain control of their asthma for positive outcomes (Osur, 2005).

For chronic hypertension, the *Report of the working group on research on hypertension during pregnancy* (National Heart Lung & Blood Institute, 2001) suggested alpha-methyldopa as the only safe medication for the infant. Gilbert (2007) listed labetalol, pindolol, or nifedipine as possible alternatives. If a diuretic was needed, thiazide had the safest record. For breastfeeding mothers with mild hypertension (stage 1 or 2), the physician might consider withholding medication until the mother finished breastfeeding, and giving the lowest dose of medication for those mothers with stage 3 hypertension (Gilbert, 2007). In some cases physicians will withhold antihypertensive medications at the beginning of a pregnancy as many mothers experience more normal blood pressure due to the pregnancy (Nakhai-Pour, Rey, & Bérard, 2009).

The gold standard for managing diabetes in pregnancy is insulin (McElduff et al., 2005). There is lack of agreement on oral antidiabetic agents for pregnancy (Gilbert, 2007).

Of the second generation sulfonylureas, Glipizide and Gylburide is considered safe for pregnancy and breastfeeding. However, research continues for Micronase and DiaBeta. The meglitinides are not considered safe at this time. Few of the Insulin Sensitizers are considered safe, and the Alpha-Glucosidase Inhibitors are being considered for research (Feig et al., 2005; Gilbert, 2007).

With two exceptions, which were identified in the open ended question on the Chronic Illness Continuation/Attrition Form by two mothers, the number and type of

medications used by mothers in this study are unknown. Lagoy et al. (2005) suggested that an up-to-date source of information about medication safety, counseling services, standard communication, and experts providing oversight would decrease some of the confusion or controversy about which medications are safe for pregnancy and lactation. They further suggested that collaborative activities between government agencies, public health and health care providers, research, academic, and nonprofit organizations be developed. Kuehan (2009) also noted the need for collaborative efforts in large prospective studies and different designs for more complete information as providers may need more information or data on whether the condition or the medications cause poor outcomes in pregnancy. The addition of pregnancy exposure registries would help to further disseminate information about drug safety in pregnancy (Howland, 2009).

Conceptual Framework

Ajzen's Theory of Planned Behavior (TPB; Ajzen, 2006) was used in the study to understand the initiation and duration of breastfeeding for women with asthma, hypertension, and diabetes who wish to breastfeed. The TPB was developed out of the Theory of Reasoned Action. The basic tenet of the Theory of Reasoned Action is that a person's behavior is the result of their intention to perform that behavior/action (Ajzen, 1980; Ajzen & Fishbein, 1988). Ajzen (2002) postulated that human action was guided by behavioral beliefs, normative beliefs, and control beliefs.

TPB has three major constructs: (a) an individual understands the attributes or consequences (i.e., behavior beliefs) of a behavior/action, (b) there is an influence or expectations of others on the behavior (i.e., normative beliefs), and (c) there is a perception of control an individual believes he/she has over the behavior/action (i.e.,

control beliefs). "Perceived behavioral control in the theory of planned behavior refers generally to people's expectations regarding the degree to which they are capable of performing a given behavior, the extent to which they have the requisite resources and believe they can overcome whatever obstacles they may encounter. Whether these resources and obstacles are internal or external to the person is immaterial" (Ajzen, 2002 p. 12-13). Figure 1 below is a visualization of the concept of the TPB (Ajzen, 2006).

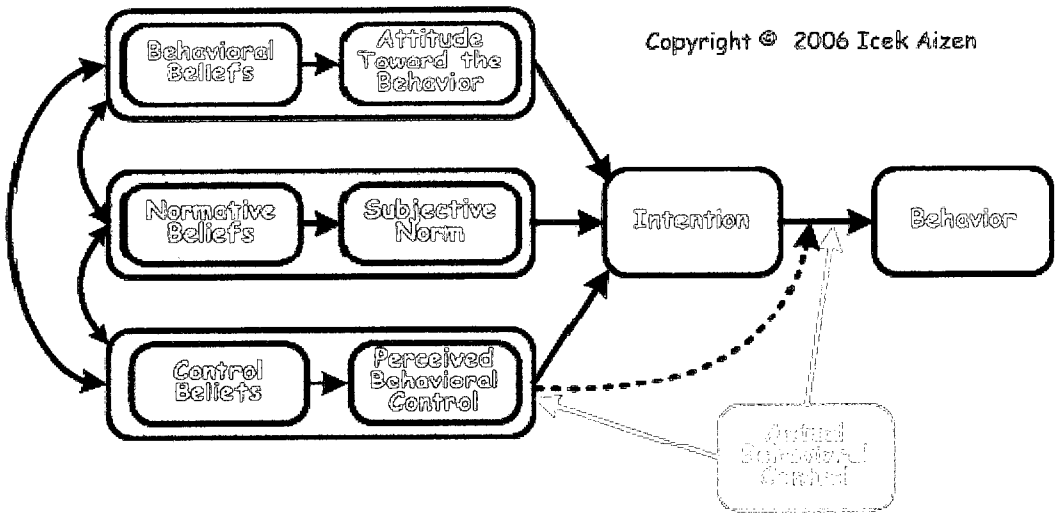

Figure 1. Ajzen's Theory of Planned Behavior (TPB).

The use of the theory for this study is reflected by the following: mothers may have negative and positive attitudes or feelings about breastfeeding (e.g., behavioral beliefs). Normative beliefs may be influenced by the baby's father, other family members, peers, employment status and location, and information/support from health care professionals. A mother's perception of control may influence the desire or motivation to breastfeed. The TPB may be particularly relevant for mothers who must adapt and manage their chronic illness, pregnancy, and breastfeeding efforts.

Several lactation studies have been done to identify concerns and behaviors in numerous groups of women, significant others, families, and health care providers. The

following studies used Ajzen's Theory of Planned Behavior on breastfeeding. Saunders-Goldson and Edwards (2004) used the theory to study 95 female African American beneficiaries of military health care to determine their intent to breastfeed based on knowledge, age, education, parity, and factors related to the theory. She found that perceived control and older women best predicted intention to breastfeed. Positive expectations were noted for health care providers and the father of the baby.

The TPB was used by Dodgson, Henly, Duckett, and Tarrant (2003) to evaluate cross cultural duration rates of breastfeeding in 209 new Hong Kong mothers. Dodgson found that the theory predicted duration of breastfeeding for these mothers. She noted the similarities of motivational factors for women living in western cultures and Chinese living in Hong Kong.

The theory was used by Swanson and Power (2005) to test subjective norms of 203 new mothers regarding bottle feeding and breastfeeding decisions and found that health care providers, particularly nurses and midwives were very important in communicating positive views of breastfeeding. In another study (Wambach et al., 2004) used the TPB for guiding questions in focus groups of 14 disadvantaged urban pregnant adolescents. That pilot study sought to determine the influencing factors in their decisions about infant feeding methods with results indicating the emergence of benefits versus barriers to breastfeeding and bottle feeding; and independent choice versus social influence. The study found that adolescents need education and support in deciding which feeding method to choose.

Heinig et al. (2006) also used the theory in focus groups of 65 WIC Program participants. They examined the relationship between maternal beliefs, feedings

intentions, and feeding behaviors for this group. Mothers in that group did not trust that health care providers would understand their life circumstances and decisions. They did not ask for help when they needed it. The researchers advocated increased awareness from providers for decision making processes of low-income women and giving positive support whenever possible.

Rempel (2004) used the TPB to study intentions and duration of 80 breastfeeding mothers up to 12 months post partum. Perceived control was of particular interest in her study. She also found that mothers need social approval for long-term breastfeeding and ongoing support and guidance providers.

Dick et al. (2002) used the theory in testing the reliability and validity of the Breastfeeding Attrition Prediction Tool (BAPT) among 269 women who planned to breastfeed for at least eight weeks. The constructs of attitude, subjective norm, and control from Ajzen's TPB theory (Janke, 1994) guided the development of the questions and interpretation of the scores which showed that negative attitudes towards breastfeeding and control best predicted breastfeeding. The Breastfeeding Attrition Prediction Tool (BAPT) was used (Appendix A) in this study because it encompasses the variables inherent within the TPB theory.

As was noted above, Ajzen's TPB provided the theoretical foundation for the study. The purpose of the study was to identify breastfeeding initiation and duration rates of mothers with asthma, hypertension, and diabetes as compared to those mothers not identified as having a chronic illness. This was the first study to explore breastfeeding behaviors for this group and to compare the differences between the groups. It is also the first study to look at the relationship between breastfeeding determinants and behavior

beliefs, normative belief, and perception of control for this group. The results may have an impact on nursing education, practice, and research.

Variables and Definitions

Dependent variables.

Breastfeeding. The act of providing nutrition for an infant by latching to the breast or by expression of milk for the baby. Recommendations from Healthy People 2010 are 75% initiation rate; 50% at six months; and 25% at twelve months. Exclusive breastfeeding rates are 50% at 3 months, and 17% at 6 months (CDC, 2007; Healthy People, 2005). Breastfeeding was measured by the BAPT, and consent to participate in the study.

Independent variables.

Chronic illness. Conditions requiring continuous management, non curative, extending over years or decades. These conditions may include non-communicable diseases, persistent chronic illness, long-term mental disorders, and impairments to structure that are ongoing (World Health Organization, 2002a). Having chronic illness was identified on the Illness and Continuation/Attrition Form.

Behavioral beliefs. An individual's understanding of the attributes or consequences of a behavior (Ajzen, 2002). Mothers may have positive or negative attitudes about breastfeeding that will affect their decision to initiate/continue breastfeeding. Breastfeeding behavioral beliefs were measured by the BAPT form (Positive and Negative Sentiments).

Normative beliefs. The influence or expectations of others on the behavior in question (Ajzen, 2002). Normative beliefs may be influenced by the baby's father, other

family members, peers, employment status, location, and information/support from health care professionals. Cultural norms would also influence normative beliefs. Breastfeeding normative beliefs were measured by the BAPT form (Social and Professional Support).

Perceived control. The perception of the control an individual believes he/she has over the behavior/action (Ajzen, 2002). Chronic illness in mothers who wish to breastfeed may diminish a mother's sense of control. Perceived control was measured by the BAPT form (Breastfeeding Control).

Gaps in the Literature

Many studies have been done in breastfeeding, particularly on initiation and duration rates. However, there is a lack of consistency about the definition of adequate breastfeeding. It is difficult to determine what is being measured if exclusive or partial breastfeeding are not clearly defined. This is particularly significant given the reports on the positive benefits that duration and exclusivity of breastfeeding has on some chronic conditions. Maternal recall has also been problematic in terms of definitions and validity of the recall.

While several studies reviewed used a theoretical framework, many did not have a unifying theory. Lack of theory appeared to be unique to the particular discipline of health care and to some journals reporting on lactation and breastfeeding. This is significant when interpreting the findings and making recommendations regarding interventions and solutions. Integration of chronic care models into care for pregnant and breastfeeding women need to be explored in addition to continuum of care.

It is well known that WIC has a negative influence on whether mothers from low-income families breastfeed their children. What needs to be explored is why this is the case, especially when it is this population that is at greatest risk for chronic health care problems for both mother and child. Another area that needs further exploration is why the US government (e.g., WIC), the largest buyer of formula, negates its obligation to the mandates of Healthy People 2010?

Insufficient milk has been identified as one of the most significant reasons for weaning. More research is needed to develop strategies that determine education content and implementation of education programs on insufficient milk and other barriers. This is especially important for mothers with chronic illness. Mothers with chronic illness are at greater risk for being separated from their infants due to complications of their pregnancy or delivery. More research is needed in implementing care that supports involvement of mothers and families into the care of infants who may need more intensive care and support of mothers who may be separated due to their own illness.

We may begin by increasing our knowledge of initiation and duration rates for this group. Furthering our understanding of their reasons for breastfeeding would be very useful. Greater knowledge of their attitudes, beliefs, and sense of control would help health care providers develop education and support programs to promote, protect, and support breastfeeding.

Purpose

In order to address some of the gaps in the literature related to breastfeeding behaviors of mothers with chronic illness the purpose of this study was to explore the initiation and duration rates of mothers identified as having asthma, hypertension and/or

diabetes who wish to breastfeed and the factors that contributed to initiation and duration/attrition. Differences between the three groups were identified. Associations between determinants/outcomes of breastfeeding initiation and duration and behavioral beliefs, normative beliefs, and perceived control of mothers with asthma, hypertension and diabetes were also identified. As chronic health conditions and associated burdens of those conditions continue to increase, a better understanding of health related/protective activities such as breastfeeding is very important.

A quantitative design was used to determine the breastfeeding initiation and attrition rates for these mothers; and to identify the factors contributing to that attrition. An open ended question about why mothers continued/discontinued breastfeeding was asked of participants. A convenience sample of 53 mothers was recruited from the community. Means and standard deviations, one way analysis of variances, and correlation analysis were used to describe and analyze the chronic illness breastfeeding groups and to examine associations between constructs on the Breastfeeding Attrition Prediction Tool (BAPT) and determinants/outcomes of breastfeeding.

Research Questions

The following research questions were explored in this study.

1. Is there a difference in initiation and duration rates of breastfeeding for mothers with asthma, hypertension, and diabetes and those mothers not identified as having chronic illness?
2. Are there differences between asthmatic, hypertensive, and diabetic mothers in their efforts to breastfeed?

3. Is there an association between determinants/outcomes of breastfeeding and behavioral beliefs, normative beliefs, and perceived control of mothers with asthma, hypertension, and diabetes?
4. What most affects mothers with asthma, hypertension, or diabetes decision to continue/discontinue breastfeeding?

Summary

Barriers/obstacles, and reasons to successful breastfeeding for mothers have been discussed. The risks of asthma, hypertension, and diabetes to pregnancy and subsequent breastfeeding difficulty have been presented. Reasons mothers identified for breastfeeding were presented. Contraindications and medications in pregnancy and breast milk have also been presented. Ajzen's TPB provided the theoretical foundation for the study. The purpose of the study was to address gaps in the literature related to lack of understanding about mothers with chronic health problems decision to breastfeed. Therefore the study identified the breastfeeding initiation and duration rates of mothers with asthma, hypertension, and diabetes. It identified some differences between the three groups of mothers, and some correlations between determinants/outcomes for breastfeeding and the constructs on the TPB. This was the first study to explore breastfeeding rates for this group and to compare the differences between the groups. The results may have an impact on nursing research, education, and practice in the following ways:

In education, the results may influence the development of a curriculum in medical and nursing programs that increases knowledge, skills, and attitudes of providers in providing effective, ethical, and cultural care in breastfeeding for this group and all

mothers. Those programs then need to be evaluated and their effectiveness researched. Public programs that educate as early as kindergarten and beyond would greatly increase understanding and acceptance of breastfeeding as the norm rather that bottle feeding for all mothers (Bottaro & Giugliani, 2009; Bunik, Gao, & Moore, 2006; Gillis, Sigman-Grant, 2010; Miller et al., 2007)

In practice, these results may support the development of more baby-friendly hospital environments that promote breastfeeding. A better understanding of how asthmatic, hypertensive, and diabetic mothers manage to breastfeed or not within the context of their chronic health conditions may help health care providers develop interventions to support and increase initiation and duration rates. The implications for this growing population could have significant consequences on the future health and well-being of their children who genetically are already at risk for their mother's chronic health problem, as breastfeeding appears to decrease the risk factors for these children.

In nursing research, attention needs to be given to further exploring issues surrounding the lack of breastfeeding by women in developed countries versus those in lesser developed countries and the lack of breastfeeding promotion in the WIC program; and the high association between bottle-feeding and chronic health problems such as diabetes, obesity, cardiovascular disease, malabsorption syndromes to name a few. Initiation rates for breastfeeding have increased from about forty-two percent in 1998 to nearly sixty percent in 2008. However, those rates are still below the 2010 Healthy People Recommendations and for minority mothers. Participation in WIC continues to be the greatest predictor for not initiating or continuing to breastfeed especially in minority populations. This is especially significant, since 50% of infants in this country

participate in the WIC program (Lawrence, 2006; Riordan, 2005; U.S. Department of Agriculture, Food & Nutrition Service, 2008).

Chapter 2

Review of the Literature

The following review of the literature examined the: (a) effects of chronic illness on pregnancy and impact on mothers' decisions/efforts to breastfeed, (b) racial/ethnic and cultural impact on breastfeeding, and (c) breastfeeding interventions.

Chronic Illness

It is well known that the health benefits of breast milk and breastfeeding have been well documented and increasing breastfeeding in the United States has been identified as an important public health priority (i.e., Healthy People 2010). However, women with chronic health problems must overcome barriers to breastfeeding that are unknown to the greater population.

About 108 million people in the U.S. have a chronic illness, with many experiencing more than one chronic condition. Projections are that by the year 2030, about half of the population in the U.S. will have a chronic health condition (World Health Organization, 2002a). The WHO defined chronic illness as a condition that requires "ongoing management over a period of years or decades" (p. 11). Individuals with chronic illness require timely, appropriate, and supportive care (Cumbie, Conley, &

Burman, 2004). Frequently when those individuals understand the benefits of a health behavior and are regarded as active partners within a health care relationship, they more readily practice healthy behaviors (Hwu & Yu, 2006).

More women are affected by chronic illness than men, and an increasing number of younger women are being diagnosed with a chronic illness (Ahluwalia, Mack & Mokdad, 2005). These researchers used the Behavior Risk Factor Surveillance System (BRFSS) data to examine chronic illness in non pregnant 18-44 year old women. Data were collected from 56,141 individuals between 1991 to 1992 and 107,425 individuals between 2000 and 2001. She found that 35% of the women had at least one chronic condition. Black women were diagnosed with two chronic conditions in over ten percent of the population, seven percent of white women had two chronic conditions, and eight percent of Hispanic women had two chronic conditions.

Women who are at greater risk for chronic illness may also be at greater risk for complications during pregnancy, delivery, and beyond. Thirty-one percent of pregnancies in this country are considered complicated with risks to the mother and baby. Too often prenatal care does not begin until 11 to 12 weeks of pregnancy (Centers for Disease Control & Prevention, 2006a). Women with chronic conditions such as asthma, hypertension, or diabetes are at greater risk of delivering prematurely, having a low birth weight baby and other complications of the pregnancy, or experiencing a cesarean delivery (Linton & Peterson, 2004). Those mothers may need additional medical support during a complicated pregnancy and delivery, and may be separated from a baby who needs intensive care. Lower rates of breastfeeding have been identified for those mothers who experience a cesarean delivery and babies who are in the Neonatal Intensive Care

Unit (NICU). Effective methods of supporting mother baby contact and breastfeeding in the NICU is very important (Chalmers, 2010; Cricco-Lizza, 2009; Karlström et al., 2007; Montgomery et al., 2008; Nyqvist et al., 2010).

Thomas (2004) conducted a post natal qualitative study of 15 women who experienced a medically complicated pregnancy to determine ways the women resolved or coped with their health problems after their pregnancy. The dominate themes that emerged were regaining normality, feelings of neglect or abandonment, and concerns about possible future threats to their health. For some women, the medical complications resolved shortly after delivery, while others described wanting to 'get back to normal' and get back to managing their chronic illness. Other women described complications of breastfeeding, feeling tired, and dealing with other medical problems. One mother described feeling abandoned by nurses and doctors in regards to her own care. She further described receiving conflicting information about whether she should breastfeed, the effect her medications would have on breastfeeding, and general lack of support from nurses. Another mother described pressure to breastfeed when she did not feel well or was tired. Thomas emphasized the need for staff to evaluate unit policies that do not support new mothers with chronic illness. New mothers with a chronic illness must deal with major physiological, emotional, and social change while attempting to regain control or manage their chronic condition in the anticlimactic event of delivery for them.

A phenomenological study by Schaefer (2004) with nine breastfeeding mothers with fibromyalgia was conducted to assess their experiences with breastfeeding. She found that the themes of muscle soreness, pain, and stiffness were identified as barriers to breastfeeding. Fatigue, although not identified as a barrier in women without chronic

illness (Callahan, Séjourné, & Denis, 2006), was identified as interfering with breastfeeding for women with fibromyalgia (Schaefer, 2004). Some women felt they needed to stop breastfeeding due to sore nipples, perceived insufficient milk supply, and the need for medication. For some, having to wean their infant before they had planned, made them feel sad and depressed, and not able to be a perfect mom. One woman described feeling unsuccessful since she was not able to breastfeed as long as she had planned. Another woman described a sense of relief that sore nipples made her have to stop breastfeeding. Women with fibromyalgia or chronic illness need additional support to overcome barriers to breastfeeding unique to their situation. Schaefer noted that additional concurrent research is needed to help women cope with symptoms of their illness and recovery from childbirth.

As was noted, mothers with chronic health conditions might be at greater risk for complications throughout their pregnancy and during labor and delivery. A study under the Department of Defense identified not only higher rates of planned and emergency cesarean deliveries for mothers with chronic health condition such as hypertension, diabetes, and asthma (e.g., age-related), but higher rates of cesarean deliveries for minority mothers. The authors, along with Fries (2010), Kruse, Denk, Feldman-Winter, and Rotondo (2005), and Newman and Hancock (2009), suggested there might not only be an association between cesarean rates and chronic diseases, but also characteristics of the providers, and organizational cultures (Linton & Peterson, 2004). One of the concerns about cesarean deliveries for all mothers was that they have an increased risk of being separated from their infants and decreased opportunity to initiate breastfeeding (Baxter, 2006).

A descriptive survey using the internet of 166 newly delivered or pregnant women with asthma done by Beckmann (2002) found they reported physical problems during their pregnancy ranging from respiratory problems that included shortness of breath, coughing, wheezing, more respiratory infections, breathlessness, and more mucus to other physical problems. The other problems included feeling tired, experiencing chest pain and tightening, increased nausea and vomiting, problems sleeping, worsening of allergies, GI reflux, shakiness/tachycardia, problems walking, pregnancy induced hypertension, and gestational diabetes. The majority of women were from the United States and Caucasian. Over half of the women viewed their asthma as mild, 32% as moderate, and 4.5% as severe, with 14 % indicating improvement in their asthma, 35% remaining the same, and 41% indicating a worsening of their asthma. The emotional problems they reported included worrying about the baby, that stress could cause an asthma attack, not wanting to go to public places that might cause an attack, labile emotions, feelings of anxiety, depression, and sadness, tired and frustrated at being short of breath, having chest pain, and worry about going to an ED or missing work. Most women felt that medical care, support, and education would have helped them to control their asthma better. The author noted the importance of nurses helping the women to understand their illness, to use medication appropriately, and to avoid triggers that worsen their asthma.

In a qualitative descriptive study of 12 pregnant women admitted to the hospital for hypertension with some symptoms of proteinuria and/or edema, and preeclampsia, Barlow, Hainsworth, and Thorton (2003) wanted to develop insights into the expectations, beliefs, and needs of the women admitted. Some of the women did not

understand why they could not take medication and rest at home as opposed to staying in the hospital. They often related their hospitalization to stress even though they had tried to decrease stress in their lives. Several of the women described frustration with inconsistent information on their condition and hospital stay, while expressing gratitude for social support. Although not explicitly stated, this study pointed to the need for information regarding risks of hypertension in pregnancy and the value of interventions, including hospitalization and nursing support.

In a study by Levy-Shiff, Har-Even, Lerman, and Hod (2002) of 153 pregnant women with pregestational diabetes (insulin dependent diabetes mellitus and non insulin dependent diabetes mellitus; PGDM), and gestational diabetes mellitus (GDM) compared the psychosocial functioning of those mothers compared to non diabetic mothers with low risk pregnancies. This study looked at how medical status, maternal coping and resources' impact pregnancy outcomes. Although the PGDM and GDM mothers had more negative emotions and fewer positive emotions associated with the pregnancy, their high risk pregnancy did not adversely affect their general well being and adjustment. PGDM was found to adversely affect their infants' psychomotor development, and GDM and PGDM had an adverse affect on cognitive development of their infants. The authors point out that the timing of metabolic disturbances may predict offspring outcomes. They also pointed out that the coping abilities of mothers and the belief that their behaviors had an impact on the health outcomes of their children helped to motivate greater metabolic control.

Clausen et al.'s (2005) study of pregnancy outcomes for women with type 2 diabetes however, found worse outcomes for type 2 diabetic women compared to those

women with type 1 diabetes and the background population. Women with type 2 diabetes had higher perinatal mortality rates as well as higher morbidity rates compared to those women with type 1 diabetes.

Providing prenatal care to women with high risk pregnancies is very important. In a study analyzing interaction logs between 85 women with diabetes, hypertension and preterm labor and Advance Practice Nurses (APN), Brooten et al. (2007) found care provided by APNs improved health outcomes and reduced cost of care. The women received half of their care from physicians and half of their care from APNs who categorized care into physiologic problems, healthcare supervision problems, nutrition, and interpersonal relationships. Care from the APNs' lasted until 8 weeks postpartum and involved one home visit. The APNs provided teaching, counseling, telephone outreach and availability with physician backup. The women had difficulty coping with rest, exercise and diet along with concerns about body changes, rest and fears about delivery. Some women had problems managing their symptoms and findings, and following up with medical care visits. Other specific problems included managing blood pressure, edema, coughing, cramping in the extremities, and problems breathing. Maintaining blood sugar levels, diets, and weight gain were also addressed by the APNs. This study emphasized the importance of early monitoring for health problems, teaching about prevention, and the appropriate use of APNs in providing care to reduce re-hospitalizations and cost of health care.

Prevention and pre-conception care were also elements of a qualitative study of pre pregnancy care for 21 pregnant women with type 1 and type 2 diabetes who attended diabetic antenatal clinics. The women were interviewed about their contraceptive use,

their diabetes and pregnancy and what motivated them to attend or not to attend pre-pregnancy care clinics. All of the women had some knowledge of the importance of maintaining good glycemic control, and potential problems with pregnancy and diabetes such as the risk of malformation and macrosomia. Insights gained from the study included the need for integrating diabetes care with reproductive and contraceptive advice to women, increasing their knowledge of the optimal time between stopping contraception and conception, and more intensive care between pregnancies. The study also emphasized the need for better communication between providers and women with diabetes (Murphy et al., 2010)

Racial/Ethnic and Cultural Impact on Breastfeeding

In the United States, health disparities continue to exist for lower socioeconomic groups, racial and ethnic minorities, and native cultures (Liao et al., 2004). The above groups tend to experience higher rates of chronic illness and lower rates of breastfeeding, particularly exclusive breastfeeding (Bentley et al., 2003; Celi et al., 2005; Centers for Disease Control & Prevention, 2006b; Dodgson et al., 2003; Gibson-Davis & Brooks-Gunn, 2006; Li et al., 2005).

Dodgson et al.'s (2003) study of 209 the Ojibwe of Northern Minnesota found that many cultural aspects promoting breastfeeding had been lost. Their ethnographic study sought to understand breastfeeding disparities for this group. The importance of historical influences, Ojibwe culture, and traditional breastfeeding models emerged from her study. Forced assimilation into another culture, urbanization, and receiving care from non native providers or providers who lacked sensitivity to or understanding of the culture was the experience of many Ojibwe women. The women adopted beliefs and

practices that accepted formula feeding rather than promoting breastfeeding. Separation from role models or those who could share the traditions regarding breastfeeding and the value placed on breast milk and breastfeeding/ mothering practices regarding health were shared by the women. Study participants were able to identify positive aspects of breastfeeding and a desire to reintegrate traditional practices into infant feeding practices. Dodgson and her colleagues (2003) expressed hope that individuals who work with indigenous groups would be able to "encounter, connect, and learn about the traditions of the indigenous people they serve" (p. 60). Rhodes, Hellerstedt, Davey, Pirie, and Daly (2008), found similar positive attitudes and focus within this group of 380 prenatal women, 342 mothers at 2 weeks, and 256 mothers at 6 months. The mothers were from one Native American urban clinic and three Ojibwe reservations in Minnesota. She found that mothers received positive support from their husbands and boyfriends on initiation. At 2 weeks post partum mothers received support from their mothers. At six months post partum, the use of native medicines and cigarette smoking were significantly associated with breastfeeding. She suggested that not only female relatives and friends be included in prenatal education/visits, but also husbands and boyfriends.

In a case study of 136 low-income African American women enrolled in WIC, Bentley et al. (2003) used the Social Ecological Framework to explain low breastfeeding rates for this group in Baltimore, MD. The model divides influencing factors on breastfeeding into spheres from the macro-level to micro-level. The media, politics, economics, policy/ organizations, community/environment, interpersonal relationships, and individual knowledge and beliefs were defined as influencing a mother's decision the breastfeed. Bentley and associates (2003) asserted that factors well beyond the

individual, family, or community can effect mothers' beliefs, decision making process, and power in carrying out decisions regarding breastfeeding initiation and continuation. They also emphasized the importance of a shift in the dominant cultural norm (e.g., formula feeding-for this group) and structures/institutions that support that norm.

Celi et al.'s (2005) prospective study of immigration, race/ethnicity, social, and economic factors as predictors of breastfeeding initiation of 1,829 pregnant women in eastern MA, found that cultural factors such as immigration status and education were important in breastfeeding decision making. Considerable differences in initiation rates were noted within racial/ethnic groups where immigrant mothers breastfeed at higher rates than U.S.-born mothers.

Gibson-Davis and Brooks-Gunn (2006) identified the same phenomenon or "Hispanic paradox" (p. 641) in a multi-city longitudinal birth cohort study of new births. Participants included both parents consisting of 4207 mothers and 3013 fathers of Mexican Hispanic, non Mexican Hispanic, and non Hispanic decent. Immigrant status or those new to the country, had higher rates of breastfeeding than those of the same race/ethnicity that were born in the U.S. The rates were higher for immigrant mothers regardless of education or income and thus the paradox. Information about immigration status or country of origin may help in developing culturally appropriate education material and approaches for these groups of mothers.

Medications and Breastfeeding

About 81% of American adults use prescriptions, over the counter medications, and herbal supplements. Women use more medications than men (Lagoy et al., 2005). Of women between the ages of 18-44 years, 82% currently use a medication, with 46% of

the age group using a prescription drug. Women in this age group use about two separate prescription drugs per pregnancy. Use of prescription drugs during pregnancy is nearly 60%. Many women do not know they are pregnant while taking prescribed medications (Andrade et al., 2004). Thirteen percent of pregnant women use an herbal supplement during their pregnancy (Lagoy et al, 2005).

The effects of certain medications on pregnancy can be devastating if taken and in some cases can also be devastating if not taken. Women and sometimes physicians may be unsure about which medications are safe or most efficacious, and do not sufficiently utilize pharmacists to gain important information (Andrade et al., 2004; Mashayekhi, Dilmaghanizadeb, Fardiazar, Bamdad-Moghadam, & Ghandforouch-Sattari, 2009). Those mothers who seek information about the effects of medications on pregnancy are often first time mothers without experience or knowledge of the effects of medications on themselves or their baby (Mashayekhi et al., 2009; Shieh, McDaniel, & Ke, 2009).

Asthma. Women with asthma should continue to take their prescribed medications during pregnancy and breastfeeding. Common medications used to treat asthma are corticosteroids and bronchodilators including beta agonists (e.g., albuterol, terbutaline, metproterenol) which have been identified as safe for the infant. Corticosteroids are L2 C, although inhaled corticosteroids have not been found to be associated with birth defects, low birth weight, pre term delivery or pregnancy induced hypertension (Benninger & McCallister, 2010), Albuterol is L1 C, terbutaline is L2 B and metproterenol is L3 B. Categories A and B are generally considered safe for pregnant women, with some exceptions to the first trimester. Category C is evaluated on the basis

of benefit to risk. L1 is considered the safest, L2 safer, L3 moderately safe, L4 possibly hazardous, and L5 as contraindicated (Hale, 2006).

Acute exacerbations and exercise induced asthma are treated with beta agonists (Riordan, 2005). Unfortunately, some mothers may stop taking their medication during pregnancy and breastfeeding out of fear that the medications will hurt their baby. In some cases mothers will not start or will stop breastfeeding out of fear that the medications will hurt their baby. More harm can be done to the mother by stopping the medication during pregnancy and breastfeeding and to the baby by not breastfeeding as uncontrolled asthma increases the risk for low birth weights, preterm deliveries and malformations (Kemp & Kakakios, 2004; Lagoy et al., 2004; National Asthma Education & Prevention Program, 2004; Osur, 2005).

A study of 4,315 black and white pregnant women with asthma by Carroll et al. (2005), found that pregnant black women with asthma were more likely to visit an emergency room, need rescue medication, or be hospitalized. Thirty-five percent of black women as compared to 25% of white women received inadequate prenatal care, perhaps decreasing their opportunity to breastfeed. Although all women had similar access to health care, black women received less education about self-management, received less specialist referrals, and had higher asthma specific morbidity.

Hypertension. As with other chronic conditions requiring medication management, hypertensive medications should not be automatically stopped during pregnancy or breastfeeding. Several medications for hypertension have been shown to be safe for breastfeeding mothers. Beta blockers (e.g., oxprenolol, dilevalol, mepindolol, propranolol) have been shown to be safe for breastfeeding mothers (Beardmore, Morris,

& Gallery, 2002). Also found was the safety of calcium channel blockers (e.g., dihydropyridines, nitrendipine, nimodipine), methyldopa, and angiotensin-converting enzyme (ACE) inhibitors all which have minimal transfer into breast milk. In some cases, medications were discontinued for mothers with mild hypertension stage 1 or 2, or given the lowest dose for those mothers in stage 3 (Gilbert, 2007).

Diabetes. The gold standard for managing hyperglycemia in pregnancy is insulin (McElduff et al., 2005). If medication is needed during breastfeeding, insulin is recommended, with caution for mothers to watch for hypoglycemic reactions in themselves. There is some controversy about the use of oral hypoglycemic medications during pregnancy and breastfeeding. Oral hypoglycemic medications such as Metformin and glyburide are generally considered safe (Hale, 2006). All women should discuss all medication use, including herbal supplements, with their physician.

Breastfeeding: Issues and Solutions

Health care providers, institutions, employers, families, and the public can affect mothers' decisions to initiate and continue breastfeeding, especially within a relevant cultural context. Provider support (e.g., physicians, nurses, lactation consultants, other health professionals) and education may have the most significant impact on a mother's decision to breastfeed (Shealy et al., 2005; Taveras et al., 2004; Wambach & Koehn, 2005). Providers often need to be educated about lactation and then communicate the information in a consistent and supportive manner to mothers (Bunik et al., 2006; Heinig et al., 2009; Mantha et al., 2008; McInnes & Chambers, 2008; Miller et al., 2007; Nelson, 2007; Rosen, Krueger, Carney, & Graham, 2008 Shealy et al., 2005; Spatz & Sternberg, 2005; Taveras et al., 2004). Cattanio (2008) pointed out the importance of providing

information about the harm of formula feeding. He suggested that information presented to patients not only emphasize the benefits of breastfeeding but the harm of formula and that mothers need not feel guilty about not being able to breastfeed. Heinig et al. (2009) though, advised that caution be used in giving information about the harm of formula for mothers who feel they have no choice but to use formula. Gillis and Sigman-Grant (2010) recommended that providers use ethical underpinnings of patient autonomy, patient welfare, and social justice in promoting, supporting, and protecting breastfeeding. They also clarified that if a mother decided not to breastfeed, then that decision should also be respected.

Due to physician time constraints and sometimes lack of knowledge, nurses, lactation nurses or lactation consultants are most often in the best position to give information and support to mothers (Fenwick et al., 2001; Haas et al., 2006; Hong et al., 2003; Miracle, Meier, & Bennett, 2004; Taveras et al., 2004). In a study of 65 WIC eligible mothers, Heinig et al. (2009) found through focus group discussion that mothers were more open to information from providers who were confident with their information, were respectful and calm, and showed empathy towards the mothers. In another study done on 109 low income black WIC participants in California by Mickens, Modeste, Montgomery, and Taylor (2009) found that attendance in a support group significantly increased the intention to breastfeed among the participants. The author noted the importance of community based education and the impact of social factors on intention to breastfeed. Ordway (2008) suggested that nurses and other health care providers provide information and support within a framework of women's ways of knowing. An understanding by nurses of the stage (e.g., silence, received knowledge,

subjective knowledge, procedural knowledge, constructed knowledge), a mother is in would facilitate more understanding and perhaps behavioral change.

Miracle et al. (2004) found in a prospective study of 21 mothers with very low birth weight infants who intended to formula feed, that when physicians or nurses gave them information about the benefits of breastfeeding and breast milk, mothers changed their minds about methods of feeding. Mothers described lack of role models, fear of pain, inconvenience, and lack of understanding about the benefits of breast milk for their babies in making their initial decision. Many mothers verbalized an increased sense of power in giving their babies something no one else could, and wanting to do the best for their babies when they decided to breastfeed. The mothers were able to overcome problems in breastfeeding with information and support without feeling pressured to breastfeed. Dowling, Shapiro, Burant, and Elfettoh (2009) found similar responses in their study of mothers 38 white mothers and 46 black mothers of pre term infants. They found that mothers understood the vulnerability of their babies and wanted to protect them through breastfeeding. This was equally true for black and white mothers.

In a phenomenological study of 20 first-time mothers, it was found that nurses could give emotional, informational, and tangible/physical support that increased breastfeeding for the mothers (Hong et al., 2003). The mothers reported an appreciation of anticipatory guidance or what to expect as first-time mothers. They also felt discouraged by nurses who did not perform adequate assessments, offer assistance, especially within the first hour, seemed too busy, or lacked knowledge about breastfeeding. Mothers felt that nurses who appeared to be invasive gave conflicting

advice, or offered formula as a solution to breastfeeding problems and discouraged the mothers from breastfeeding.

A study using a grounded theory method of 28 mothers with infants in a neonatal nursery by Fenwick et al. (2001) described mothers' efforts to mother their infants in an inhibitive nursery setting. Although the study was not specifically about breastfeeding, it painted a poignant picture of how powerless, ineffective, discouraged, angry, and depressed mothers and fathers can feel regarding the care of their infants. Specific feelings described by mothers included annoyance, frustration, distress, bitterness, unsure, ignorant, inadequate, anxious, guilty, foolish, and disconnected from their infants due to interactions with nurses.

Hass et al. (2006) found that the establishment of lactation services in a naval hospital increased the rate of breastfeeding for mothers. They also found previous breastfeeding experience and education predicted continued breastfeeding at 6 weeks and 6 months for 934 active duty and military family women .

Institutional support. Hospital policy and procedures have an effect on breastfeeding initiation and duration rates (Labbok, Wardlaw, Blanc, Clark, & Terreri, 2005; Merewood, Mehta, Chamberlain, Philipp, & Bauchner, 2005; Philipp, 2003; Shealy et al., 2005). Breastfeeding protection, support, and promotion needs to be continual and should involve all providers who are in a position to give information, support, and care to the new mother. Interventions should begin well before delivery and continue after discharge into the community. Interventions should target support groups, family support groups, information/education groups, one on one support/information; and include technology and evidence based practice (Ball, 2009; Cricco-Lizza, 2009; Dowling et al.,

2009; Geraghty, Riddle, & Shaikh, 2008; Godfrey & Meyers, 2009; Hannula, Kaunonen, & Tarkka, 2008; Mickens, 2009; Murray, 2006).

Exclusive breastfeeding is also affected by institutional policies (Declercq, Labbok, Sakala, & O'Hara, 2009; Labbok et al., 2005). Merewood et al. (2005) analyzed data from designated U.S. Baby Friendly hospitals to determine breastfeeding rates. As part of their designation, baby-friendly hospitals use the Ten Steps to Successful Breastfeeding as guidelines for practice. She found elevated rates for initiation of breastfeeding and exclusive breastfeeding in those 28 hospitals, regardless of demographics. Low income mothers and African American mothers had higher rates of breastfeeding in the baby-friendly hospitals. A later study by Merewood et al. (2007) found that 248 low income black mothers delivering in U.S. Baby Friendly hospitals, had breastfeeding rates comparable to the overall U.S. population at six months. Hospital practices supportive of breastfeeding reduced problems with breastfeeding and increased breastfeeding rates even for women of low socioeconomic status (Murray, Ricketts, & Dellaport, 2007; Tender et al., 2009). Perhaps no other initiative has had a greater positive impact on the increasing initiation and duration of breastfeeding than the Baby Friendly hospital initiative (Heinig, 2010).

DiGirolamo, Grummer-Strawn, and Fein (2001) found in their study of maternity care practices that the number of steps implemented in baby-friendly hospitals was associated with breastfeeding success for 1,907 post partum mothers who returned surveys about their experiences. Those mothers' who delivered in hospitals that implemented up to five steps, were eight times more likely to breastfeed up to six weeks compared to mothers who did not experience any of the steps. In a follow up study,

DiGirolamo, Grummer-Strawn, and Fein (2008) came to similar conclusions, in that of the 1,097 mothers who did not experience any of the Baby Friendly hospital practices were about 13 times more likely to terminate breastfeeding early as compared to the mothers who experienced 6 of the practices. Implementation of all ten steps is recommended (World Health Organization, 1998).

Even without the designation of Baby Friendly hospital status, hospital units can develop and implement practices to support breastfeeding. In a prospective study of data from 19 hospitals participating in the Perinatal Services Network (PSN) practicing skin-to-skin mother infant contact, Bramson et al. (2010) found that early and sustained skin-to-skin contact between mother and infant increased exclusive breastfeeding rates during the hospital stay.

In a systematic review of breastfeeding promotion in neonatal units, Renfrew et al. (2009) also found that skin to skin kangaroo care increased breastfeeding duration and that providers skilled in breastfeeding knowledge and giving support were more cost effective than just having regular staff. In that review, having Baby Friendly hospital status also increased breastfeeding outcomes.

The distribution of formula from hospitals has a negative effect on breastfeeding especially for groups of mothers who already experience low rates. Mothers who are ill, less educated, nonwhite, first time moms, and are participating in the WIC program are most vulnerable to using formula (Shealy et al., 2005; U.S. Government Accountability Office, 2006b). A study by Declercq et al. (2009) questioned 519 primiparas, and 1,052 multiparas about their intention to breastfeed and experiences related to seven practices associated with exclusive breastfeeding. They found a difference of greater than 10% of

first time mothers who had intended to exclusively breastfeed and actual breastfeeding one week after delivery. Hospital practices of giving supplemental feedings, use of pacifiers, and being given free formula were identified by mothers as being inhibiting to exclusive breastfeeding. The authors point out that more than 400,000 infants who could have been exclusively breastfed, may not have been because of hospital practices.

Rosenberg, Eastham, Kasehagen, and Sandoval (2008) found that 68.8% of 3,895 mothers who had initiated breastfeeding in the hospital were given commercial hospital discharge packs. The mothers were less likely to breastfeed exclusively beyond 10 weeks as compared to those mothers who did not receive the commercial discharge packs. Twenty-five percent of infants born in 2005 were given formula supplements within two days of birth (Centers for Disease Control & Prevention, 2008a). About three-fifths of differences in exclusive breastfeeding rates were due to socio-demographic factors, but hospital practices may account for the rest (Kruse et al., 2005). In a Canadian study on in-hospital formula supplementation of 564 healthy breastfeeding babies and interviews with self selected post partum nurses, Gagnon et al. (2005) found that mothers who had attributes of planning to breastfeed, planning to exclusively breastfeed, had childbirth education, completed community college, had a male infant, and were born in Canada were more protected against hospital supplementation. Nurses reported breastfeeding difficulties that included maternal fatigue, poor latch/sucking, infant health, maternal motivation and culture as influencing nursing decisions to give supplementation.

Employer support. More and more women are employed outside the home. Over two-thirds of those women have children under the age of three. About one-third of new mothers return to work within 12 weeks and the remainder return in 6 months

(Bureau of Labor Statistics, 2005; U.S. Breastfeeding Committee, 2004; U.S. Department of Labor, 2004). Breastfeeding initiation rates are not negatively affected by employment; however, duration rates are negatively impacted by employment.

Rojjanasrirat's (2004) descriptive study of the experiences of 50 women returning to work found that women who had support, developed strategies for different situations, maintained a positive attitude, and decreased their stress were able to continue providing breast milk for their babies. Women in management, administrative, and professional occupations were able to breastfeed longer than women in clerical, service, or factory type jobs. The women in Rojjanasrirat's (2004) study were well educated, middle class, Caucasian, and had access to adequate breast pumps. Employers who provide time to pump breast milk, location for privacy and storage of milk had higher rates of breastfeeding moms. Those employees had fewer sick days due to infant illness, lower health care cost for the infants, and higher morale. More states are enacting legislation requiring employers to provide accommodations for breastfeeding mothers that are safe, private, have adequate storage, and means to wash/clean equipment and hands, and time to breastfeed (Shealy et al., 2005).

Slusser, Lange, Dickson, Hawks, and Cohen (2004) found that in addition to the above, a good quality double pump increased optimal breast milk production and longer duration of breastfeeding. Their study found that having support from an employer reduced stress and increased their milk supply for two hundred eighty-three mothers who were working for an insurance company. Having a comfortable and secluded location to breastfeed was found to be important to 19,039 active-duty Navy enlisted and 3,051 officer mothers who combined returning to work with breastfeeding (Uriell, Perry, Kee,

& Burress, 2009). Having access to a quality pump to support breastfeeding was also very important to low income mothers with infants who were pre mature or ill (Chamberlain, McMahon, Philipp, & Merewood, 2006). Health care providers can help mothers return to work with targeted information, anticipatory guidance, and support, particularly in identifying support groups (Angeletti, 2009).

Family support. Family members, particularly partners of the mother, or the baby's father, and grandmothers have a significant influence on a mothers' decision to breastfeed (Hannan et al., 2005; Harner & McCarter-Spaulding, 2004; Shaker, Scott, & Reid, 2004; Shealy et al., 2005; Susin, Guigliani, & Kummer, 2005). Shaker et al.'s (2004) study of 129 parents' attitudes about infant feeding determined if the mother would breastfeed or not. Both parents in their study had misconceptions about breastfeeding in terms of convenience and feeding in public even with knowledge of breast milk superiority. Increasing understanding about prenatal parental attitudes could help in developing breastfeeding promotion.

Falceto et al. (2004a) and Harner and McCarter-Spaulding (2004) found that not only the relationship of the parental couple but the father's age had an effect on a mothers' decision to breastfeed. Falceto et al. (2004a) found that quality of the relationship of 118 couples did not negatively affect breastfeeding at four months. In Harner and McCarter-Spaulding's (2004) study, 86 teenagers, 28 were partnered with an adult partner and 59 were partnered with a teen. A partner who was a peer of the teenager was more likely to have a positive effect on a teen mother's decision to breastfeed as opposed to an older adult partner. Grandmothers have a significant impact on the decision especially in the absence of role models for breastfeeding. Susin et al.

(2005) found grandmothers had a negative effect on breastfeeding decisions in a study of 601 mothers who were influenced by their grandmothers to give their babies other forms of milk. Interventions that encouraged education of mothers and family members were emphasized in the study. A qualitative study of eight fathers done by Sherriff, Hall, and Pickin (2009) about their perspectives on breastfeeding indicated a need for health care providers to acknowledge the role of fathers in breastfeeding decisions and to engage fathers throughout the care of mothers to increase breastfeeding.

Public support. Public perception of constraints of breastfeeding can exert constraints on breastfeeding mothers. Opinions from 2,369 U.S. adults who responded the Healthstyles 2000 survey about their perceptions of breastfeeding found that 45% thought that breastfeeding inhibited a mothers' lifestyle, 31% thought that infants should be fed cereal by three months of age, and the same percentage felt that infants should not be breastfed beyond the age of one year. Breastfeeding in public was considered embarrassing by 27% of US adults (Li, Zhao, Mokdad, Barker, & Grummer-Strawn, 2003). Participants in the study were categorized as white, black, Hispanic, and Asian/Pacific islander. These researchers found that people with lower education, unmarried, and from the South Atlantic region considered breastfeeding in public as embarrassing. Although some responses regarding breastfeeding were positive, groups who were non-white, under 30 and over 65 years of age with low income and education had negative attitudes toward breastfeeding. The contradiction of viewing women's breast from a sexual/aesthetic perspective and as a means of nursing an infant was confusing for many (Li et al., 2003). Programs that educate as early as kindergarten and throughout professional training would greatly increase understanding and acceptance of

breastfeeding as the norm and a right amongst providers and the public, rather than bottle feeding (Bottaro & Guigliani, 2009; Bunik et al., 2006; Gillis & Sigman-Grant, 2010; Miller et al., 2007; Wilkerson, Fung, May, & Elliott, 2010).

Media has a significant impact on perceptions of breastfeeding and breastfeeding rates (Foss & Southwell, 2005; Merewood & Heinig, 2004). Foss and Southwell's (2005) review of advertisements and articles in a popular parent magazine found an inverse relationship between the numbers of advertisements for formula or hand feeding, and articles about formula and breastfeeding, especially for new mothers. Merewood and Heinig (2004) and Foss (2005) suggested public education and advertising campaigns that promote breastfeeding to change attitudes and behavior. Identifying a behavior such as use of formula as a health risk behavior also requires the provision of activities that support positive behavior (Merewood & Heinig, 2004).

Racial/ethnic considerations and cultural understanding. Equal access to health care is important to any group or individual seeking help. In 1999, the Institute of Medicine (IOM) was asked by Congress to access the extent of disparities in health care. The IOM (Institute of Medicine, 2002) found that ethnic/racial minorities received lower quality of care irrespective of access or insurance coverage. The group found that bias, prejudice, and stereotyping may contribute to differences in care given by health care providers. Recommendations were that providers first acknowledge the existence of disparities in health care. The report also emphasized the importance of standardized methods of data collection.

Disparities continue for low income, racial and ethnic minorities who have higher rates of disease. Treatment and access are more limited for them (Halle, Lewis, &

Seshamani, 2009). Hill et al.'s (2007) study found that low income was found to be predictive of low milk volume production for 81 mothers of pre-term infants. The author suggested that mothers with lower incomes may need more support and encouragement when pumping as they may have fewer resources. Reasons for lower volume such as stress were not discussed in the study. Mothers in rural communities are also often poor, without health insurance, lack access to hospital-based programs, and are also WIC program participants (Flower et al., 2008; Murray et al., 2007). An integrative study of data from the Family Life Project of 1,292 infants and a parallel ethnographic study of 30 families on initiation and duration by Flower et al. (2008), found that mothers decisions about breastfeeding were influenced by their participation in the WIC program, going back to work, and on lack of support with breastfeeding. Many mothers did not consider breastfeeding due to lack of assistance, embarrassment, or discomfort. Breastfeeding rates are lower for low income and minority groups including Native Americans and those participating in the WIC programs.

As with Native Americans and other minorities in the United States, breastfeeding rates are lower for First Nations communities in Canada. Morbidity rates in children are also higher for this group. Martens (2002) did a study using chart audits of 283 mothers evaluating the impact of community health nurses and peer counselor programs promoting breastfeeding for the Sagkeeng First Nation. She found greater satisfaction of participants with information given by peer counselors and health nurses. Greater satisfaction meant a decrease in weaning from breastfeeding for this group. A phenomenological study of eight black women in a focus group by McCarter-Spaulding (2007) found little differences in their experiences compared to other groups. The author

points out the need for greater awareness of stereotyping on the part of researches towards minorities. Nurses who are knowledgeable and sensitive to different cultural/ethnic perspectives are better able to give information and support to many different groups.

Costs related to breastfeeding. Financial savings, less impact on the environment, and health benefits for the baby and mother have been described in the literature. Weimer (2001) and Riordan (2005) estimated a savings of over $3 billion due mostly to lower health care costs, through breastfeeding, with less impact on the environment from disposal of bottles, packaging, and manufacturing. Providers have been encouraged to give more information on the risks of not breastfeeding (American Academy of Pediatrics, 2005; Smith, Dunstone, & Elliott-Rudder, 2009). Smith et al. (2009) analyzed informational content of titles and abstracts used in the American Academy of Pediatrics (AAP) policy statement on breastfeeding and human milk to determine if formula feeding was identified with poorer health outcomes for mothers and babies. She advocated for clear, strong communication from health care providers on the risks of not breastfeeding and the emphasis on breast milk and breast feeding as the norm. The benefits of human milk for babies were determined to be greater than formula even after analysis found multiple environmental contaminants such as persistent organic pollutants, pesticides, and heavy metals in human milk (Mead, 2008). A similar view was presented by Walker (2007), who described an array of contaminants in formula, such as: lead, aluminum, silicon, nitrates, atrazine (a weed killer), genetically modified ingredients (e.g., corn, soy), bacteria, carrageenan (food stabilizer), and glycated lipids. Cattaneo (2007) described frustration in an editorial, in which he determined that health

care providers were not providing clear, strong support for breastfeeding as the norm. In terms of guilt that some mothers might feel for not breastfeeding, his suggestion was that policies, health systems, and health providers should respond not mothers. Wolf (2007), however, asserted that good scientific research/evidence has not been conducted or presented on the benefits of breastfeeding; and that recent breastfeeding campaigns/ads have used scare tactics against mothers. The author did not discuss the stake that formula companies have in framing campaigns on breastfeeding.

Summary

Women who have asthma, hypertension, and diabetes may experience some or all of the obstacles/barriers to breastfeeding mentioned in this literature review. They may also experience medical complications and give birth to babies who are low birth weight, large for gestational age, premature, hypoxic, or hypoglycemic. Thirty-one percent of pregnancies in this country are considered complicated with risks to the mother and baby. If women with these chronic health states would breastfeed, their health and the health of their children would be significantly improved and there could be a decrease in the incidence of these children also acquiring the chronic health condition. Increased knowledge of these mothers' attitudes, beliefs, and behaviors towards breastfeeding may help health care providers to develop and implement programs and strategies for these groups of mothers to achieve optimal breastfeeding outcomes.

Chapter 3

Methodology

Health behavior studies are often done to predict actions of individuals or populations. If health care providers can understand how certain conditions can influence health decisions or behaviors, then interventions can be developed to support healthy decisions/behaviors. Ajzen's TPB was used in guiding the perspective of this exploratory study. The relationship of behavioral beliefs, normative beliefs, and control beliefs of mothers with asthma, hypertension, and diabetes to breastfeeding behaviors was explored. The relationship between demographic data on the BAPT form and attached questions to breastfeeding behavior was also explored. The findings will hopefully increase knowledge of breastfeeding initiation and duration rates for these groups, and give insight into interventions that support a breastfeeding dyad. This chapter will discuss the research design, instrumentation, sample, setting, and limitations for this study. A discussion of data collection, data analysis, and protection of human subjects will be presented.

Research Design

This exploratory study used a retrospective quantitative methodology and qualitative elements to understand the factors that influenced initiation and continuation/

attrition of breastfeeding for mothers with such chronic health conditions as asthma, hypertension, and diabetes and to identify the factors contributing to attrition. These findings may facilitate the development of nursing interventions that could ameliorate some of the barriers to breast feeding in this population. The research questions specific to this study were:

1. Is there a difference in initiation and duration rates of breastfeeding for mothers with asthma, hypertension, and diabetes and those mothers not identified as having a chronic illness?
2. Are there differences between groups of mothers with asthma, hypertension, and diabetes and their efforts to breastfeed?
3. Are there associations between determinants/outcomes of breastfeeding and behavioral beliefs, normative beliefs, and perceived control of mothers with chronic health conditions?
4. What most affects a mother's decision to continue/discontinue breastfeeding?

Instrumentation

The Breastfeeding Attrition Prediction Tool (BAPT). The BAPT (Janke, 1994) is a 52-item questionnaire (Appendix A) with Likert-type scales that measure three aspects of breastfeeding: (a) positive and negative attitudes toward breastfeeding; (b) family, social, and professional support for breastfeeding; and (c) the perceived control the mother has in performing breastfeeding. These independent characteristics are measured by four scales.

Negative Breastfeeding Sentiment (NBS) and Positive Breastfeeding Sentiment (PBS), where high scores indicate low levels of positivity and low scores indicate high

levels of positive sentiment, measure breastfeeding attitudes (e.g., *breast milk is best for the baby*, *breastfeeding is messy*). The Social and Professional Support scale (SPS) measures subjective norms or support from family, friends, and professionals. High scores indicate a high degree of social and professional support. The Breastfeeding Control Scale (BFS) measures the perceived control mothers feel they have to support a long-term breastfeeding regimen with low scores indicate more control. The scoring guidelines can be found in Appendix B. Content validity ($\alpha = .80$) of the instrument was established by lactation nurses, with a predictive value of 73%. Previous measures of the internal consistency reliabilities of the BAPT scales were acceptable, ranging from .79 to .85 (Janke, 1994).

The following data collected from the BAPT were included: primary method of breastfeeding, intended length of breastfeeding, when decision to breastfeed was made, time after birth child was breastfed, main reasons chosen to breastfeed, birth date of newborn, type of delivery, birth weight of baby, infant's sex, previous breastfeeding, length of time of last breastfeeding, type of breastfeeding experience, number of children given birth to, age of mother, ethnic origin, highest grade completed, annual family income, marital status, mother primary health care provider, and baby primary health care provider.

The BAPT was used by Ryser (2004) to determine the effect of an interventional educational program called Breast Start for low income women in Texas. Pre and post tests were done. Reliability coefficients for positive breastfeeding were .78 and .83; for negative breastfeeding the coefficients were .85 and .90. Social and professional support scales had $r = .84$ and .83, and a reliability coefficient of .90 for breastfeeding control.

Ryser (2004) reported that 74.1% of the cases had been accurately predicted. Her study demonstrated that as negative attitudes decreased, positive attitudes increased and breastfeeding increased. Dick (2002) tested the reliability and validity of the BAPT on mothers who wanted to breastfeed for 8 weeks. She found that attitude and control predicted behavior more than social and professional factors and that the instrument was 73% predictive of breastfeeding status at 8 weeks. After modification to the instrument, reliability ranged from .78 to .86.

The observed internal consistency reliabilities (Table 1) are consistent with those reported in previous studies (Dick et al., 2004; Janke, 1994; Ryser, 2004) and are at acceptable levels based on recommendations by Nunnally and Berstein (1994). Table 1 compares the reliabilities of the above studies from the literature with the present study.

Table 1

Comparison of Reliabilities

Subscales	**Janke (1994)**	**Dick (2002)**	**Ryser (2004)**	**Landis Chronic Illness Study (2010**
Breastfeeding Control (BFC)	.81	.86	.90, .90	.86
Negative Breastfeeding Sentiment (NBS)	.83	.78	.85, .90	.73
Positive Breastfeeding Sentiment (PBS)	.79	.79	.78, .83	.86
Social and Professional Support (SPS)	.85	.83	.84, .83	.74

The Chronic Illness and Continuation/Attrition Form (Appendix C) was developed to identify which chronic illness; asthma, hypertension, or diabetes each participant had. The question on the form asked: What is your chronic illness? Possible responses were asthma, hypertension, or diabetes. The qualitative component of this exploratory study asked the following open ended question: What most affected your decision to continue and/or then to stop breastfeeding? Answers provided by the mothers were assessed for common themes that might further the understanding of the answers provided on the BAPT instrument.

Procedures

Sample and sampling. Pregnant women who were over 18 years of age; English-speaking; were asthmatic, hypertensive, or diabetic prior to their pregnancy; had ever breastfed or who wanted to breastfeed within the past 3 years (Li, Scanlon, & Serdula, 2005) were invited to participate in the study. A total sample of 53 mothers responded; 18 mothers with asthma, nine mothers with hypertension, and 26 mothers with diabetes were recruited into the study from the community. Recruitment lasted for 7 months. All mothers who met the criteria were accepted into the study.

Flyers and information from the flyers were used as the recruitment tool. Flyers (Appendix E) were placed in community settings and information from the flyers was posted on the internet. Mothers who were interested in participating were asked to contact the researcher by way of the researcher's email or telephone number listed on the flyer information. After previous chronic illness was established, the consent form (Appendix D), BAPT, and the Chronic Illness and Continuation/Attrition Form were given to or mailed to the individuals. A $25.00 gift certificate of appreciation was given

to participants, whether they returned the forms or not. Forms were coded upon receipt and will be kept in a secure location by the researcher for a maximum of 5 years.

Since this was an exploratory study, the goals were to determine if acquiring a sample population was feasible and if data obtained could potentially address some of the gaps in the literature. The results of this study could lay the foundation for a larger study.

Data Analysis. Analysis of the quantitative data included comparisons of means and standard deviations. Descriptive analysis was conducted to determine the characteristics of the sample. Comparisons were made between the number of study mothers who initiated breastfeeding at 6 months and 12 months, the mothers not identified as having chronic illness form the literature, and the recommendations from Healthy People 2010. The comparison answered the research interest, Is there a difference in initiation and duration rates of breastfeeding for mothers with asthma, hypertension, and diabetes and those mothers not identified as having chronic illness?

Means and standard deviations and one-way analysis of variance (ANOVA) tests were used to compare differences between the three groups of breastfeeding mothers with asthma, hypertension, and diabetes and answered the research question, Is there a difference between groups of mothers with asthma, hypertension, and diabetes and their efforts to breastfeed?

A correlational analysis was done on the BAPT items to determine the association of the items and answered the research question, Is there an association between determinants/outcomes of breastfeeding and behavioral beliefs, normative beliefs, and perceived control of mothers with asthma, hypertension and diabetes?

Qualitative analysis was done to identify themes or repeated phrases that facilitated better understanding of the answers to the BAPT and the Chronic Illness and Continuation/Attrition Form.

Variables. The variables for the study and how they were measured are listed below on Table 2.

Table 2

Variables

Variable	Instrument	Measured Dimension	Number of Items	Scoring
Dependent:				
Breastfeeding	BAPT	Primary method of feeding	2	Breastfeeding or bottle feeding
Independent:				
Chronic Illness	Chronic Illness and Continuation/ Attrition Form	Type of chronic illness	3	Asthma, hypertension, diabetes
Attitudes and Beliefs	BAPT	Attributes or consequences of behavior	58	Likert-type scale 1-6
Normative Beliefs	BAPT	Social and professional support	26	Likert-type scale 1-6
Perceived Control	BAPT	Perception of control	10	Likert-type scale 1-6

Protection of human subjects. Institutional Review Board (IRB) approval was obtained from the University of San Diego and consent forms were signed by the participants. Participants were informed of the minimal risks such as fatigue from participating in the study and that they could withdraw at any time. Original forms and data were coded for confidentiality and will be safeguarded in a secure location. All original data will be destroyed within 5 years.

Limitations of the Study

Sampling. There are a number of limitations to this study. Every effort was made to recruit and accept as many participants as met the criteria. However, the size of the sample was small and uneven between the groups ($N = 53$), 18 mothers having asthma, 9 mothers having hypertension, and 26 having diabetes. All of the mothers had intended and initiated breastfeeding. The mothers who participated may have been more motivated to breastfeed, and thus more willing to participate in a study. Many of the characteristics of the participants such as intention to breastfeed, early decision to breastfeed, previous successful breastfeeding experiences, older mother, predominantly Caucasian, highly educated, higher income level, and predominantly married have already been identified as predictive of breastfeeding success.

Methodology. The participants in the study were self selecting. For the six the mothers had more than one illness, they were asked to identify which illness most impacted their lives. Although 3 years has been identified as valid recall time, there may have been some recall bias along with self selection of mothers already interested in breastfeeding. The BAPT does not identify exclusive breastfeeding. There may also have been some confusion about which child was being breastfed. An additional concern

was the number of mothers who listed, *as long as possible*, for intended breastfeeding time and could not be analyzed. Additionally, scoring of the BAPT (inverse values) was confusing and cumbersome at times. Nevertheless, new knowledge about the rates, differences, and attitudes, beliefs, behaviors and perceived sense of control for these mothers is very important.

Chapter 4

Findings from the Study

This was an exploratory study that used a retrospective quantitative methodology to identify the characteristics/determinants that influenced initiation and continuation/ attrition of breastfeeding for mothers with such chronic health conditions as asthma, hypertension, and diabetes. Although this was not an integrated study, an open ended question about what most affected their decision to continue/discontinue breastfeeding was asked of the participants.

Description of the Sample

The sample consisted of 53 mothers. The characteristics of the sample are noted in Table 3. The majority were Caucasian, married, older, more highly educated, experienced breast feeders, with higher incomes, and higher rates of breastfeeding on initiation, at 6 months, and at 12 months. The majority also made the decision to breastfeed before pregnancy, initiated breastfeeding within 3 hours of delivery, had cesarean deliveries, had an average of two children, felt their breastfeeding experiences were very successful, and had health care providers in addition to obstetricians. Health, immunity and risk reduction were listed by the majority of mothers as reasons to breastfeed, while health related reasons were also listed by the majority as a reason to

continue. Discontinuing breastfeeding was related to milk supply, work, pregnancy and weight loss, lack of support, baby behavior, disapproval, inconvenience, desire, and they met their goal.

Table 3

Description of the Sample

Characteristic	*N*	*n*	*%*	*Mean (SD)*
Type of Chronic Illness	53			
1. Asthma		18	34	
2. Hypertension		9	17	
3. Diabetes		26	49	
4. Multiple		6	11	
Feeding Method				
1. Breastfeeding	53		100	
How long do you intend to breastfeed?	50			
1. 1 – 24 months		38	72	11.36
2. As long as possible		12	23	(4.61)
3. No response		3	6	
When did you decide to breastfeed?	53			
1. Before pregnancy		38	72	
2. During first trimester		8	15	
3. During second trimester		3	6	
4. During third trimester		3	6	
5. After baby was born		1	2	
How soon after birth did you breastfeed your baby?	53			4.12
(Range = 25 minutes to 36 hours)				(8.20)
Type of birth	53			
1. Vaginal		25	47	
2. Cesarean		28	53	
Weight of baby at birth (ounces)				124.51
(Range = 37 oz. to 165 oz.)				(23.02)
How many children have you given birth to?	53			2.08
(Range = 1 to 11)				(1.70)
Gender of baby	52			
1. Male		24	45	
2. Female		28	53	
3. Missing		1	2	

Characteristic	*N*	*n*	*%*	*Mean (SD)*
Have you ever breastfeed before?	53			
1. Yes		36	68	
2. No		16	30	
3. Missing		1	2	
How long did you breastfeed your last child? (months)		39	74	15.53
(Missing)		14	26	(13.43)
Was the experience:	53			
1. Extremely successful		23	43	
2. Very successful		8	15	
3. Moderately successful		1	2	
4. Slightly successful		4	8	
5. Not at all successful		1	2	
6. Missing		16	30	
Age of mother (years)	53			33.96
(Range = 25 to 50 years)				(5.80)
Ethnicity	53			
1. Black		0	0	
2. Asian		3	6	
3. White		41	77	
4. Hispanic		6	11	
5. Native American		2	4	
6. Other		1	2	
Highest grade level completed (years)				16.00
(Range = 13 to 20 years)				(1.92)
Annual family income (in thousands)	53			5.77
1. 10 to 25		2	4	(2.01)
2. 25 to 40		7	13	
3. 40 to 55		9	17	
4. 55 to 75		7	13	
5. 75 to 85		2	4	
6. 85 to 100		10	19	
7. Over 100		16	30	

Characteristic	*N*	*n*	*%*	*Mean (SD)*
Marital status	53			
1. Single		4	8	
2. Married		48	91	
3. Missing		1	2	
Primary health care provider	53			
1. Nurse midwife		1	2	
2. Obstetrician		19	36	
3. Family practice physician		22	42	
4. Other		11	21	
Primary health care provider (for baby)	53			
1. Obstetrician		48	91	
2. Family practice physician		4	8	
3. Other		1	2	

Over half of the mothers listed health as reasons to breastfeed. If immunity and risk reduction are added to health, then nearly 80% of the mothers listed health or health related reasons to breastfeed. Data were taken from the BAPT form question on reasons to breastfeed. Responses were labeled and summed.

Tables 4 and 5 answer Research question #1: *Is there a difference in initiation and duration rates of breastfeeding for mothers with asthma, hypertension, and diabetes and those mothers not identified as having chronic illness?* This question is important as it relates to intention to initiate and continue breastfeeding.

Table 4

The Main Reasons for Choosing to Breastfeed?

Reason(s) Given	*n*	*%*
Health (baby and mother)	31	58
Cost	31	58
Bonding	14	26
Convenience	11	21
Immunity and risk reduction	11	21
Nutrition (best, better)	10	19
Natural	8	15
Weight loss	2	4
Independence	2	4
Other	5	9

The Chronic Illness and Continuation/Attrition Form was used to identify what most affected the mothers' decision to continue to breastfeed and then to stop. Mothers reasons to continue breastfeeding included: (a) health of baby; (b) nutrition; (c) bonding; (d) convenience; (e) cost; (f) natural; (g) professional support; (h) other support; (i) education; (j) cues from the baby; (k) overcoming challenges; (l) norms, values, and needs of the mother.

Mothers reasons for discontinuing breastfeeding included: (a) insufficient milk supply, (b) work, (c) pregnancy, (d) weight loss, (e) lack of support from providers, (f) behavior of baby, (g) mother desire, (h) disapproval, (i) inconvenience, and (j) breastfeeding goal was met.

Table 5 indicates that mothers identified as having asthma, hypertension or diabetes exceeded national rates for breastfeeding on initiation, at 6 months, and 12 months. They also exceeded the 2010 Healthy People recommendations for breastfeeding initiation, at 6 and 12 months. The rate at 6 months is nearly double that of the national rates and at 1 year more than double that of the national rates. Breastfeeding rates for mothers with chronic illness at 24 months are close to the national rates at 12 months. Data were compared between 2010 Healthy People recommendations and previously published national data, and summation from the BAPT question on duration of breastfeeding for the study groups. Although it does not address the differences between the groups of mothers with asthma, hypertension, and diabetes, the high numbers for initiation and continuation point to strong intention for all the groups.

Table 5

Rates of Breastfeeding

	National (not identified as having chronic illness)	*Chronic Illness Study Group*	*2010 Healthy People Recommendation*
Initiation	74.2%	100%	75%
6 months	43.1%	85%	50%
12 months	21.4$	49%	25%
24 months		18%	

As has been noted in the literature review, mothers in this study were Caucasian, married, older, more highly educated, experienced breast feeders, and with higher

incomes, had higher rates for initiation and continuation of breastfeeding at 6 months, and 12 months (Bai et al., 2009; Bently, et al., 2003; Kong & Lee, 2004; Racine et al., 2009; Tiedje, 2001; Wambach et al., 2005). Other research identified the following breastfeeding determinants: intention to breastfeed, time of decision to breastfeed, time of first breastfeeding, type of birth, birth weight of the baby, breastfeeding experience, length of breastfeeding last child, success of breastfeeding experience, parity, and participation in the WIC program (Chapman & Pérez-Escamilla, 2009; Hill & Aldag, 2005; Kronborg & Vaeth, 2004; Lee, et al., 2005; Racine, 2009). All these findings were supported in this research study except for participation in the WIC program.

The data was assessed by comparing data between 2010 Healthy People Recommendations and previously published national data, and summation from the BAPT question on duration of breastfeeding for the study groups. There was a difference in initiation and duration rates of breastfeeding for mothers with asthma, hypertension, and diabetes compared to mothers not identified as having a chronic illness, and the Healthy People 2010 recommendations. Mothers with Asthma, Hypertension, and Diabetes in this sample had higher rates of breastfeeding on initiation (!00%), and at 6 months and 12 months as compared to those mothers not identified as having a chronic illness and the Healthy People 2010 recommendations.

Tables 6, 7, and 8 answer research question # 2: *Are there differences between groups of mothers with asthma, hypertension, and diabetes and their efforts to breastfeed?* Table 6 lists the means and standard deviations for assessing the breastfeeding attrition and prediction component of the BAPT instrument for all participants (N = 53), and for each illness group separately. It compares some of the

differences between the three groups of mothers and their efforts to breastfeed and specifically answered an element of the question: *Are there differences between groups of mothers with asthma, hypertension, and asthma?*

Intention to breastfeed has been identified as most predictive for the act of breastfeeding. As was noted in Table 5, participants had an initiation rate of 100% and 94% intention rate to breastfeed (6 % or 3 of the mothers did not respond to the question). What is notable are the differences between the intended time to breastfeed and the length of time for breastfeeding between mothers with diabetes, hypertension, and asthma. For mothers with asthma, breastfeeding length of time was nearly double the intended time they had listed; while mothers with hypertension and diabetes were very close to the intended time they identified. Mothers with diabetes had higher rates of previous breastfeeding experience than mothers did in the other two groups.

The baby's weight, length of time after birth before beginning breastfeeding, and type of delivery for mothers with these chronic illnesses was also identified. Mothers with asthma had a higher percentage of vaginal births; whereas, mothers with hypertension and diabetes were more likely to have cesarean sections. Mothers with asthma and vaginal deliveries were more likely to breastfeed sooner after delivery and to have had previous breastfeeding experience. See Table 6 for the comparisons of the means and standard deviations of mothers with asthma, hypertension and diabetes.

Table 6

Means and Standard Deviations for All Participants and for Each Illness Group Separately (N = 53)

		Total Sample	***Asthma (n = 18)***	***Hypertension (n = 9)***	***Diabetes (n = 26)***
How long do you intend to BF? (months)	Mean	11.36	10.07	13.06	11.15
	SD	(4.61)	(3.94)	(4.49)	(4.85)
When did you decide to BF? (1-2 is before	Mean		1.28	1.44	1.69
pregnancy or 1st trimester)	SD		(0.67)	(1.01)	(1.12)
How soon after birth did you BF? (hours)	Mean	4.12	2.38	4.44	5.24
	SD	(8.20)	(4.78)	(8.02)	(10.00)
Type of birth					
1. Vaginal		25	12	4	9
2. Cesarean		28	6	5	17
Weight of baby (ounces)	Mean	124	126.59	105.39	129.77
	SD	(23.02)	(19.13)	(28.53)	(20.56)
Previous BF experience					
1. Yes		36	13	4	19
2. No		16	5	4	7
How long did you BF your last child? (months)	Mean	15.53	22.46	12.00	11.55
	SD	(13.43)	(19.07)	(7.87)	(6.57)
Was the experience	Mean	1.70	1.69	1.50	1.75
1. Extremely successful	SD	(1.13)	(1.18)	(0.58)	(1.21)
2. Very successful					
3. Moderately successful					
4. Slightly successful					
5. Not at all successful					
How many children have you given birth to?	Mean	2.08	2.22	2.56	1.81
	SD	(1.70)	(1.11)	(3.24)	(1.27)
Age of mother	Mean	33.96	34.33	36.33	32.88
	SD	(5.80)	(6.88)	(5.15)	(5.10)
Education (Grade Level)	Mean	16.00	15.95	15.56	16.19
	SD	(1.92)	(1.70)	(2.60)	(1.86)
Family Income (in Thousands)	Mean	5.77	4.72	5.67	6.64
4 = 40-55, 5 = 55-70, 6 = 70-85, 7 = 85-100	SD	(2.01)	(1.93)	(2.29)	(1.65)

Table 7 compares the means and standard deviations for the BFS component of the BAPT and further indicated differences between the three groups. PBS is significantly different between the Asthma group and the Diabetes and Hypertensive group as measured by the BAPT. Mothers with asthma had more positive BFC and PBS ($p \leq .01$) compared to mothers with diabetes. However, they had lower values for SPS compared to mothers with hypertension and diabetes.

Table 7

Means and (Standard Deviations) for the BAPT Subscales for All Participants (N = 53)

	Total Sample	***Asthma (n = 18)***	***Hypertension (n = 9)***	***Diabetes (n = 26)***
Breastfeeding Control (BFC)	43.21	16.11	17.22	20.15
	(9.48)	(5.82)	(5.02)	(8.30)
Negative Breastfeeding Sentiment	34.49	191.17	162.33	195.88
Attitudinal (NBS)	(10.09)	(80.21)	(75.43)	(60.83)
Positive Breastfeeding Sentiment	26.67**	29.56	40.44	47.46
Attitudinal (PBS)	(8.37)	(17.28)	(18.08)	(20.68)
Social and Professional Support	29.56	54.28	67.22	65.04
(SPS)	(10.11)	(24.03)	(17.70)	(26.27)

*$p \leq .05$, **$p \leq .01$

Potential differences in PBS levels were evaluated using a one-way ANOVA, revealing a significant overall difference ($F [2, 50] = 4.4, p =. 01$). The post hoc Scheffé was conducted and indicated that the average PBS was significantly lower ($p = .03$) in the Asthma group than the Diabetes group, indicating higher levels of PBS for the asthma

group. The asthma groups also showed higher levels of SPS compared to the other two groups.

Table 8

Illness Group ANOVA for BAPT Scales

	Asthma (n = 18)	Hypertension (n = 9)	Diabetes (n = 26)	*df*	*F*	η^2	*p*
Breastfeeding Control (BFC)	16.11 (5.82)	17.22 (5.02)	20.15 (8.30)	2	1.86	0.07	0.17
Negative Breastfeeding Sentiment Attitudinal (NBS)	191.17 (80.21)	162.33 (75.43)	195.88 (60.83)	2	0.78	0.03	0.46
Positive Breastfeeding Sentiment Attitudinal (PBS)	29.56 (17.28)	40.44 (18.08)	47.46 (20.68)	2	4.64	0.16	0.01
Social and Professional Support (SPS)	54.28 (24.03)	67.22 (17.70)	65.04 (26.27)	2	1.31	0.05	0.28

Note. Standard deviations appear in parentheses below means.

For data for Research Question #2 was assessed by comparing means and standard deviations, and using ANOVA. Mothers in all three groups initiated breastfeeding at 100%, while mothers in the asthma group breastfed longer, and longer than the intended time stated. Those mothers had lower rates of cesarean births, and had more Positive Breastfeeding Sentiment than mothers with diabetes or hypertension.

Table 9 begins to answer Research Question # 3: *Are there associations between determinants/outcomes of breastfeeding and behavioral beliefs, normative beliefs, and perceived control of mothers with chronic health conditions?* A correlation matrix (Table 9) was developed and showed that mothers who decided to breastfeed earlier reported higher levels of BFC on the BAPT. Mothers also reported perceived success of

breastfeeding experience and length of time breastfeeding to higher levels of BFC. Those mothers who experienced a cesarean delivery tended to report lower levels of PBS and had higher levels of PBS the longer they breastfed. Family income was also associated with higher levels of PBS.

Table 9

Correlations Between the BAPT Scales, Breastfeeding Attrition, and Participant Demographics (N=53)

	BFC	*NBS*	*PBS*	*SPS*
When did you decide to breastfeed?	0.33*	-0.18	0.20	0.26
Type of birth	0.16	-0.10	0.33*	-0.17
Length of time previous child BF (months)	-0.35	0.17	-0.32*	-0.13
Preceived success of breastfeeding experience	0.73**	-0.18	0.26	0.29
Number of births	-0.19	0.01	0.05	0.06
Age of mother	0.06	-0.17	0.11	0.17
Education (grade level)	0.25	-0.23	0.10	0.11
Family income	0.25	0.04	0.34*	-0.06

Note. BFC = Breastfeeding Control, NBS = Negative Breastfeeding Sentiment, PBS = Positive Breastfeeding Sentiment, SPS = Social and Professional Support, Type of birth (0 = vaginal, 1 = Cesarean); Breastfed previous child (0 = yes, 1 = no); Perceived success was measured using a 5-point Likert scale (1 = extremely successful, 5 = not at all successful).

*$p<.05$. **$p<.01$.

The data for research question 3 was assessed by correlation analysis. Mothers reported higher levels of BFC the earlier they decided to breastfeed, had breastfeeding experiences, experienced longer breastfeeding time, and greater perceived success.

Greater PBS was reported by mothers who did not have a Cesarean delivery and had longer breastfeeding time.

Qualitative Results

Research Question # 4: What most affects a mother's decision to continue/ discontinue breastfeeding? An open-ended question related to what affects a mother's decision to continue or discontinue breastfeeding at the end of the Chronic Illness Continuation/ Attrition Form was analyzed for recurrent themes.

Asthma. All 18 of the asthma participants responded to this question. The reasons identified for continuing to breastfeed included:

1. *Healthier for the baby and mother.* Mothers identified concerns for the health of their baby and themselves as reasons to continue to breastfeeding. Mothers stated that "I wanted to continue breastfeeding because it's what's best for me and my baby." "I am pre-diabetic and have asthma, anything I can do to prevent my kids from having these is the best reward." "I originally chose to breastfeed solely for health reasons. I have adult onset chronic asthma and any chance bf would either prevent asthma or reduce its onset or severity was worth it to me. Once I realized how much more there was to breastfeeding, all of the benefits for mother and baby, plus the emotional benefits, I would never choose anything else." "Knowing how good it was for my babies. I was particularly concerned that they not get allergies and asthma." "I worked for a peds office and my observations were that all breastfed babies were only seen for well baby visits while bottle fed babies would come in more often with ear infections, thrush, chest congestion, allergies, etc., so my conclusion-breast fed babies were just healthier due to breastfeeding

benefits-they even looked healthier than formula fed babies . . . I even noticed that they were thinner as they got older than formula fed babies." "Happy, healthy children, convenience of breastfeeding, lower risk from drug transfer into milk than from formula, long term health and emotional benefits of breastfeeding." "I'm still feeding because it is working, I'm producing plenty of milk and I know it is best for my son-especially with all the flu and swine flu. I'm providing his only defense since he can't have the shots."

2. *Nutrition.* Mothers stated that breast milk was the most nutritious food for their babies and a reason to continue to breastfeed. "It is the best source of nutrition for my daughter and best way to keep her chances of developing illnesses (normal and chronic)."
3. *Cues from the baby.* Mothers responded to cues from their babies in continuing to breastfeed. "My child's health, her desire to keep breastfeeding, my love of feeding her and protecting her with my antibodies, the closeness I felt to her."
4. *Rewarding or satisfying for mother (bonding).* A sense of satisfaction or reward for continuing to breastfeed their babies was stated as a reason to continue to breastfeed. "I feel more satisfied with my choice especially when someone tells me how smart and or advanced they are for their age. I also feel satisfied when they aren't getting sick as frequently as our friends children." "I would rather adapt my life to be able to keep nursing because I know breastfeeding can reduce or delay the risk of my child developing asthma." "I love the bonding I had with my baby when I nursed her." "It is making me a better eater-wanting to be more healthy and I am more aware of what I eat and how much".

5. *Convenience.* Mothers stated that convenience was important in their decision to continue to breastfeed. "How nice it was not to carry H2O, bottles, formula around, and how nice it was not to be sterilizing nipples, bottles every day. My milk was always available, always warm, and it was easy to do." "It was so easy to breastfeed."
6. *Norms, values and needs.* Mothers stated that they considered breastfeeding normal and what they needed and wanted to do. "Breastfeeding is the norm in my family and community, it fits my values and needs." "I was raised to believe that breastfeeding is the norm. I will breastfeed my son until he decides to stop." "Breastfeeding is important to me and before my babies were born I made the decision that I would make it work no matter what." "I don't regret anything and I would do it again."
7. *Professional support.* Mothers stated an appreciation for the support they received form physicians and lactation consultants in continuing to breastfeed. "I was concerned about bf and being on asthma controlling medications but after talking with doctors found out it was safe, I wanted to bf for the healthy reasons for baby." "I had major difficulties breastfeeding with multiple lactation consultant visits."

The reasons identified for stopping breastfeeding for mothers with asthma included:

1. *Self weaning/baby behavior.* "With my son we quit at 11 months because he was a bitter. He bit so hard he instantly drew blood one day and I decided I was done." "I stopped at 2 years old since I felt she was old enough to be more

independent." "She weaned herself." "I felt a year was enough time to nurse her. She started getting a lot of teeth and that was getting difficult."

2. *Pregnancy and weight loss.* "I stopped breastfeeding both children when I was pregnant and started losing too much weight."
3. *Insufficient milk supply/work/ and difficulty.* "My milk dried up shortly after getting pregnant with my son." "I am still breastfeeding but supplementing with formula due to supply issues." "I pumped when I went back to work but milk ran out at 51/2 months." "I pumped until I dried up."
4. *Social acceptance/inconvenience.* "Sometimes it was not so convenient like when we were out dining and you have to be in the middle of your own meal and around other guests." "I had serious difficulty."

Hypertension. The nine mothers who participated stated that continuing to breastfeed was related to the following.

1. *Healthier for baby and mother.* Mothers identified health benefits for their baby and themselves as a reason to continue breastfeeding. "Ease and health benefits to the baby." "I feel that breastfeeding helped my hypertension, because it was one of the most peaceful and relaxing things I have ever done. It also calmed his heart on days when he would get upset. I also nursed him when he got shots so that calmed he and I both." "I also felt it would be healthier for the baby and me overall".
2. *Nutrition.* Mothers listed knowledge of the properties of breast milk as opposed to formula as a reason to breastfeed. "Reading *Nursing mother, working mother,*

by Gale Pryor. The list of everything in breast milk (and not formula) was so encouraging."

3. *Bonding and skin to skin contact.* Bonding and skin to skin contact were listed by mothers as reasons to continue to breastfeed. "I love the bond it allows me to have with my son. My son remains healthy and happy, so I continue to breastfeed." "To bond with my son, enjoy the skin to skin contact. To continue to gain his immunities from me."
4. *Overcoming challenges.* Awareness of the benefits of breastfeeding in severe weather and being available to their babies were identified as reasons to continue to breastfeed by these mothers. "Knowing that even when I feel tied down by a baby who only wants mom, the health benefits are worth it and this stage goes by quickly anyway." "The knowledge I can feed my baby despite being unable to get out in severe weather. Being able to keep my baby hydrated while hospitalized. In other words-security in unusual circumstances."
5. *Support and encouragement from providers.* Mothers identified provider information and support as a reason they were able to continue to breastfeed. "The new pediatrician to my son's pediatric group highly discouraged me from nursing stating that 'older moms can't always produce enough milk.' Fortunately, he left the group and one of the other Pediatricians told me not to worry about what he said." "It was helpful to have lactation consultants available for my babies who had a more difficult time nursing correctly." "The OB took the time to tell the cardiologist to change the meds to breastfeeding compatible meds." "My OB was very encouraging and helpful to prescribe nursing safe meds for my

blood pressure." "Continues successfully, but with two trips back to the hospital for lactation consultants help with latch problems." "I had a very difficult start with breastfeeding. The sores on my nipples were very painful. The lactation consultant was so helpful and helped give me confidence."

6. *Other support.* "It was certainly a lot more challenging and more of a sacrifice than I anticipated. If it wasn't the support of support groups and 1:1 conversations with lactation consultants and supportive moms, I would not have made it as long as I did and do understand why some women try and opt out early." "Being able to take extra time off from work greatly impacted my decision to continue breastfeeding exclusively."
7. *Natural.* "Even though breastfeeding is a natural part of human existence, it is not automatic to the baby or mother (at least in my experience)." "It's such a natural and nutritious way of my baby's development."

The reasons identified for stopping breastfeeding for mothers with hypertension were:

1. *Self weaning of baby.* "He weaned himself."
2. *Going back to work/milk insufficiency.* "Went back to work but continued to pump. At one year pumping got more difficult and milk supply began to go down."
3. *Health of mother.* " I went through two surgeries and suffered a severe kidney infection and had to stop bf for three weeks. Even though I preferred, I was not able to keep my milk flow up."

4. *Disapproval.* "I breastfed her until she was 4 years. The only people it bothered were my family and strangers."
5. *Lack of support from providers.* "With my 3rd child, the postpartum nurses I worked with were so negative. I only nursed for 6 months."

Diabetes. Twenty-one of the 26 mothers who participated stated the reasons they continued breastfeeding were the following.

1. *Healthier for baby and mother.* The mothers identified health of baby and mother as reasons to continue to breastfeed. "Breastfeeding is best for my baby. It also keeps my blood glucose lower which is a plus." "We were successful and it was best for both of us." "Lost majority of pregnancy weight in the first month." "My type 1 diabetes diagnosis gives me hope that by breastfeeding, my baby will have a least a slightly better chance of not getting this condition."
2. *Bonding.* "The bonding with my baby gives me the motivation to continue breastfeeding until she's at least a year old." "I wanted the closeness/bonding with the baby as well as the nutritional benefits that come with breastfeeding." "My babies loved breastfeeding. It was how they went to sleep for naps and at night. It was a joyful part of our routine." "Such a bonding experience." "Bonding with the baby made me want to continue."
3. *Nutrition, cost and convenience.* "Cost and nutrition for the baby . . . have not stopped yet." "Breastfeeding was difficult for me. However, knowing it is best for my baby, the lower cost factor." "Believed breast milk provided best possible nutrition, immunological benefits and protection from chemical elements (like

BPA)." "Formula is expensive, and it has ingredients in it that I don't want my baby to have." "Enjoyed being my baby's primary source of nutrition."

4. *Provider support, other support and education.* "I learned of breast milk's amazing properties in a breastfeeding class before my daughter's birth. I believe education and the support of the lactation consultants in the hospital were key to our decision and success. I was particularly impressed to learn that breast milk's nutritional composition adapts to provide the perfect nutrients for a baby at whatever gestational age it's born and throughout infancy." "I began breastfeeding because I believed it was the most nutritious option and helped the immune system. I did also feel some pressure to at least try from family as it was the 'best'. It was going so well, so easy. She was thriving. I didn't have to think about formula expiring or bringing bottles, plus I could comfort her easily." "The support of important people like doctor and husband."

The reasons identified for stopping breastfeeding for mothers with diabetes were:

1. *Achieved goal and self weaning.* "I had met the goal we had set...24 months for each child." "My 2 year old weaning himself (quit requesting)".
2. *Mother desire and health.* "I feared being diabetic and having occasional high blood sugar was negatively affecting my daughter-she was gaining weight quickly." "Skin infection at diabetic pump site requiring antibiotic that could be dangerous for baby caused me to stop." "Freedom and I was happy with how long I did it." "Personal desire."

3. *Pregnancy.* "I had planned to continue through pregnancy and then tandem feed, but I miscarried. My caregiver at the time insisted it may have been the cause." " We discontinued when I became pregnant again."
4. *Lack of support.* "I had such a poor experience . . . I wanted to breastfeed but no info/support."
5. *Work/ insufficient milk supply.* "I will be going back to work at 1 year and plan on stopping, but if it works to go longer, I may let baby self-wean." "My supply decreased when I started supplementing to return to work. I decided not to pump with this baby because it was time consuming." "I stopped primarily to return to work. I wasn't willing to work around a pumping schedule while at work." "My milk supply dried up after an illness." "I pumped when I went back to work, but milk ran out."
6. *Social Acceptance.* "Social acceptance is what made me want to stop at 1 year."

Summary of Qualitative Analysis

In general the mothers' answers to this question, despite the type of chronic illness, reflected that health of baby and mother, nutrition, bonding, convenience, cost, natural, professional support, other support, education, cues from the baby, overcoming challenges, and norms, values, and needs of the mother were all critical in their decision to continue breastfeeding. Overall, their reasons for discontinuing breastfeeding included insufficient milk supply, work, pregnancy, weight loss, lack of support from providers, behavior of baby, mother desire, disapproval, inconvenience, and that their goal for breastfeeding was met.

Summary of Findings

The Breastfeeding Attrition Prediction Tool (BAPT) and the Chronic Illness Continuation/ Attritions Form were used to measure method of feeding, length of intended breastfeeding, time of decision of breastfeeding, when a decision was made to breastfeed, how soon after birth the infant was breastfed, the main reasons to breastfeed, newborn's birth date, type of delivery, weight of the baby at birth, previous breastfeeding experience, length of time last child was breastfed, quality of the experience, number of children given birth to, ethnic origin of the mother, highest grade level completed, annual family income, marital status, primary health care provider of mother, primary health care provider for the baby, type of chronic illness, and what most affected mothers' decision to continue and/or then to stop breastfeeding. Mothers with chronic illnesses (asthma, hypertension, and diabetes) from this sample were predominantly Caucasian, married, more highly educated, had high incomes, and high rates of breastfeeding (on initiation, at 6 months, and 12 months).

There were differences between the intended time and length of time for breastfeeding between mothers with diabetes, hypertension, and asthma: mothers with asthma breastfed longer than their original intent.

Baby weight and length of time after birth of breastfeeding for mothers with diabetes, asthma, and hypertension were also different. The weight of the baby tended to be higher in the diabetic group, perhaps an indication of poor diabetic control. This group also breastfed later at birth than the other two groups.

These mothers had higher rates a cesarean birth than the national average and diabetic mothers had the highest rate across the three groups at 65%. Initiation was

similar for all three groups. However, time after birth to initiate breastfeeding was longer for the diabetic group with shorter duration compared to the other two groups.

Mothers reported higher levels of breast feeding control the earlier they decided to breastfeed, if they had previous breastfeeding experience, if they experienced longer breastfeeding time, and if they experienced a greater perceived success in breastfeeding. Mothers who reported greater PBS were those who delivered vaginally and had longer breastfeeding times.

Behavioral Beliefs were measured on the BAPT as positive breastfeeding attitudes or negative breastfeeding attitudes. PBS were significantly different between the asthma group and the diabetes group. Subjects in the asthma group reported a significantly higher degree of positive beliefs and attitudes related to breastfeeding, which may be due to the severity of diabetes. PBS was not significantly different, however, between participants in the asthma group and the hypertension group. Ryser (2004) found that as PBS increased, NBS decreased. Mothers in this study scored highest on the PBS scales indicating greater knowledge/ understanding of the benefits of breastfeeding and the perhaps the consequences of not breastfeeding. However, mothers who delivered by Cesarean tended to report lower levels of PBS, and higher levels of NBS also consistent with Ryser (2004) and Dick et al. (2002) who noted greater NBS and PBC.

Normative Beliefs were measured on the BAPT as support/influence from family, friends, employers, and health care providers. There was a relationship between SPS and BFC for this sample. The mothers in this study did not consider SPS as important as

mothers in Saunders-Goldson and Edwards (2004), Swanson and Power (2005), and Wambach and Koehn's (2004) studies.

Perceived behavioral control was measured on the BAPT. Mothers who decided to breastfeed earlier reported higher levels of BFC. They also reported higher levels of BFC related to perceived success of the breastfeeding experience and length of time of breastfeeding. Positive breastfeeding control was also found to be significant by Saunders-Goldson and Edwards (2004), Dodgson et al. (2003), and Dick et al. (2002).

Mothers responses from the open ended question of what most affected their decision to continue to breastfeed included health of baby and mother, nutrition, bonding, convenience, cost, natural, professional support, other support, education, cues from the baby, overcoming challenges, and norms, values, and needs of the mother. The reasons they gave for stopping included insufficient milk supply, work, pregnancy, weight loss, lack of support from providers, behavior of baby, mother desire, disapproval, inconvenience, and their goal was met.

Of interest from this study is the greater than expected outcome that mothers with chronic illnesses are breastfeeding their children. Despite their medications, exacerbations of their illness, or conflicting information from some health care professionals, these mothers have proven otherwise. Health and helping to prevent development of their chronic illness in their children was consistently identified as reasons to initiate and continue breastfeeding. There were more positive than negative statements about initiating and continuing breastfeeding. It appears that the mothers' intention to breastfeed was shaped by their knowledge of the benefits of breast milk in preventing chronic illnesses, their perceived sense of control in their ability to breastfeed,

and the social and professional support they received. These finding will be further discussed in Chapter 5.

Chapter 5

Discussion

Projections are that by the year 2030, about half of the population in the United States, will have a chronic health condition (World Health Organization, 2002a). More women are affected by chronic illness than men, and an increasing number of younger women are being diagnosed with a chronic illness (Ahluwalia et al., 2005). Women who have a chronic health condition are at greater risk for complications during pregnancy, delivery, and beyond (Centers for Disease Control & Prevention, 2006a). Breastfeeding may be most beneficial for women with specific chronic illness and may decrease the risk or prevent those illnesses from developing in their children, especially if breastfeeding is exclusive and duration is extended (Agency for Healthcare Research & Quality, 2007; Centers for Disease Control & Prevention, 2008a; Horta et al., 2007; Kemp & Kakakios, 2004; Kull et al., 2002; Martin et al., 2004; Oddy, 2004; Oddy et al., 2004; Singhal et al., 2001; Stuebe et al., 2005). The significance of this study is that it increased our understanding of the breastfeeding behaviors of mothers with asthma, hypertension, and diabetes. The following chapter will discuss the study conclusions, implications of the findings for health policy, nursing education and practice, and recommendations for future research.

Discussion of the Findings

Mothers with chronic illness in this study had attributes defined in previous research as being predictive of breastfeeding success such as being predominantly Caucasian, married, deciding to breastfeed before pregnancy, initiating breastfeeding the first few hours after birth, having higher incomes, older, highly educated, and having previous breastfeeding experience. All of the mothers initiated breastfeeding, with the greater majority still breastfeeding at six months. Mothers identified as having asthma, hypertension, or diabetes exceeded national rates and the 2010 Healthy People recommendations for breastfeeding on initiation, at 6 months, and 12 months. However, mothers in the study also had experiences defined in previous research as being at risk for breastfeeding difficulty or failure such as challenges associated with a particular illness and experiencing a cesarean delivery.

Ajzen (2006) has written that intention is the antecedent to a particular behavior, in this case breastfeeding, and that intention is influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control. Attitudes are shaped by information and beliefs about a behavior and their consequences. The mothers in this study demonstrated positive attitudes and beliefs towards breastfeeding as shown on the BAPT. That was reinforced by their comments on the open ended question from the Chronic Illness and Continuation/Attrition Form. Their responses indicated an understanding of the benefits of breast milk for their infants and breastfeeding for themselves. Their reasons to start breastfeeding were very similar to their reasons to continue in terms of health. The mothers described an understanding of the health benefits and a desire to do whatever they could to prevent their children from developing

their particular chronic illness or illness in general. Their desire to provide the best source of nutrition that could help their infants, or in this case prevent an illness from developing, is similar to what Miracle et al. (2004) and Dowling et al. (2009) found in mothers of very low birth weight infants. Those mothers, and the mothers in this study, after receiving information or having previous knowledge on the health benefits of breast milk, wanted to do whatever they could to help their infants. They felt empowered to breastfeed, as they were the ones who could provide this to their infants.

With few exceptions, the mothers in this study indicated on the Chronic Illness Continuation/Attrition form that they received information and support about breastfeeding from lactation consultants, physicians, educational groups, support groups, other reading material, and specialized physicians. A couple of mothers described information about possible contaminants in formula as a reason to breastfeed. A few mothers indicated that breastfeeding was what was expected or the norm. While not as significant as the BAPT PBS scores, the SPS scores indicated social and professional support for this group as important. The majority of mothers identified a Family Practice Physician, Endocrinologist, or Internist along with Obstetricians, as their provider of care for their pregnancy. Greater efforts to educate physicians, including Pediatricians, and even medical students about the health benefits of breast milk and breastfeeding (American Academy of Family Physicians, 2008; Geraghty et al., 2008) may have benefited this group of mothers.

The Family Practice Physicians, Endocrinologists, Internists, Obstetricians, and others may have provided ongoing management of the mother's chronic illness before, during pregnancy, and lactation, and beyond. The importance of preconceptional,

prenatal, and interconceptional care may be particularly important for the mothers in this study with chronic illness. Having a planned pregnancy and maintaining control of their chronic illness before pregnancy may decrease adverse pregnancy outcomes. More importantly, emphasis on supporting overall women's health throughout her lifetime might increase the health of mothers and babies overall (Lu et al., 2006; Sakala & Corry, 2008; Wise, 2008). The importance of provider information and support, including that of nurses and lactation consultants was noted earlier in regards to breastfeeding. This may be of greater concern and have had a greater impact for those mothers who are separated from their infants due to a cesarean delivery.

Over half of the mothers in this study experienced a cesarean delivery. Mothers who experience a cesarean delivery are at greater risk for pain, delay of breastfeeding initiation, and separation from their babies, all of which have been shown to decrease establishment and duration of breastfeeding (Chalmers et al., 2009; Karlström et al., 2007). The group of mothers with diabetes had the highest rate of cesarean deliveries (65%), initiated first feed later, and breastfed their last child for a shorter period of time compared to the mothers with asthma and hypertension. It is unclear if these infants or mothers needed follow up intensive care. For those who may have needed intensive care, supportive breastfeeding activities would be very important even for those mothers who had previous breastfeeding experience such as the group of diabetic mothers.

Over half of the mothers though were able to initiate breastfeeding within one hour and 85% by 4 hours. Mothers in these groups may have been able to communicate their intention to breastfeed and ask for support in doing so. As was noted, the number of infants needing intensive care is unknown. Although, the mean weight for the infants was

7lbs. 75ozs, with one infant at very low birth weight, very low birth weight and a cesarean delivery are an indication for intensive care. More and more neonatal intensive care units are making efforts to create environments in the NICU that protect, promote, and support breastfeeding and acknowledge the importance of keeping mothers and babies together and to encourage skin to skin contact (Cricco-Lizza, 2009; Nyqvist et al., 2010).

Skin-to-skin contact, closeness, or bonding was noted by several mothers in this study as being enjoyable and a positive aspect of breastfeeding. Skin to skin contact has also been identified as important for infants in NICU settings. A form of skin to skin contact known as kangaroo mother care where the infant is placed skin to skin in a kangaroo position next to the mother has been shown to reduce pain, increase infant physiologic stability, increase parents response to infant cues, increase bonding and attachment, and increase both initiation and duration of breastfeeding in low or high tech settings (Bramson et al., 2010; Nyqvist et al., 2010). Again, it is unknown if or how many of the mothers and infants in this study were in an NICU or ICU setting. For infants requiring NICU care, facilitating kangaroo mother care or skin to skin contact may be very important for both infants and mothers.

Going back to school or work has been identified as a barrier to breastfeeding for many mothers. Several mothers in this study identified going back to work as a reason to discontinue breastfeeding. Their work status (i.e., part time, full time, none) was not identified in this study. However, as Shealy et al. (2005) noted, employers who provide time to pump breast milk, and a location for privacy and storage of milk, had higher rates of breastfeeding moms. Those employees had fewer sick days due to infant illness, lower

health care cost for the infants, and higher morale. The ability to pump, and continue to provide breast milk to their children while employed, may be very important to mothers with chronic health conditions, if as with this group, health is of concern.

Along with employment, many of the mothers in the study identified insufficient milk supply as a reason to discontinue breastfeeding. Although the mothers in this study exceeded breastfeeding rates for mothers not identified as having a chronic illness, and the Healthy People 2010 breastfeeding recommendations, they may have breastfed even longer with more information/support regarding their perceptions of insufficient milk supply (Gatti, 2008; Hill et al., 2007). Mothers who have experienced a caesarean delivery have listed insufficient milk, convenience, and taking medication as prime reasons for not breastfeeding or discontinuing breastfeeding. Mothers with chronic illness and those not in this study, and especially those with attributes or situations not supportive of breastfeeding may be most beneficial of information/support from providers, and institutions to continue to breastfeed (Baxter, 2006).

Mothers with chronic health conditions face challenges of managing their chronic illness while dealing with all of the changes associated with pregnancy and breastfeeding. Their chronic health conditions may improve, be stable, or be exacerbated by pregnancy and breastfeeding. Support or interventions that integrate chronic care with the known risks of pregnancy, delivery and possible separation from their infants for this group, would be beneficial (Ahmed & Sands, 2010; Barlow et al., 2008; Bury, Newbould, & Taylor, 2005; Institute of Medicine, 2001; Kaaja & Greer, 2005; Mihrshahi, Belousova, Marks, Peat, & Childhood Asthma Prevention Team; 2003; Thomas, 2004; Thompson, Roberts, Currie, & Ellwood, 2002).

Research has validated that breast feeding for at least 6 months is extremely beneficial to the infant as it relates to laying a foundation for optimal immune protection and a healthier physical state. These mothers have begun to have an impact on the future well-being of their children and their children's children by acting on their intention to breastfeed. Their intentions to breastfeed were shaped by their knowledge of the benefits of breast milk in preventing chronic illnesses (PBS), their perceived sense of control in their ability to breastfeed (BFC) and the social and professional support they received (SPS). They have accomplished this while managing their own chronic illness and sometimes receiving conflicting information from providers. The overwhelming message from the mothers in this study was that they believed in the health benefits of breastfeeding for their children and that by breastfeeding they were indeed laying a positive foundation for their health. Figure 2 reflects the results of this study in modifying the Theory of Planned Behavior so that it incorporates chronic illness and the impact it may have on these mothers intention to breastfeed.

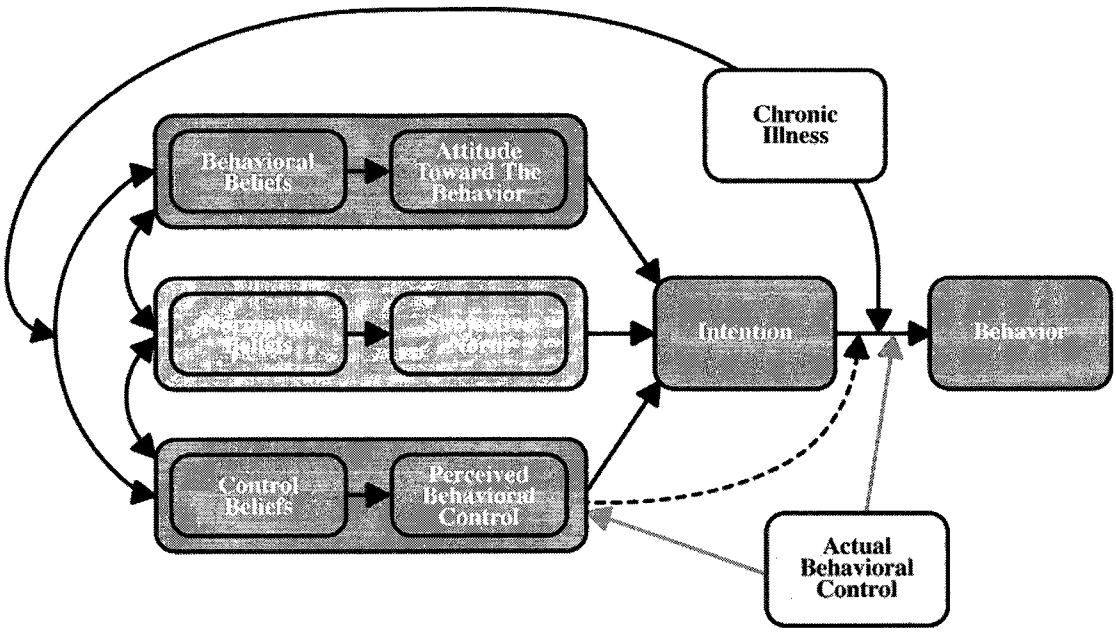

Figure 2. Modification of Ajzen's Theory of Planned Behavior

Implications for Health Policy, Nursing Education, Nursing Practice, and Nursing Research

Health Policy. Protecting, supporting, and promoting breastfeeding remains important for all groups of mothers who wish to breastfeed; but, it becomes more important for mothers with chronic illnesses as breast feeding can ameliorate the evidence of these potential conditions in their children. The WHO, the United Nations International Children's Emergency Fund (UNICEF), the Baby Friendly Hospital Initiative under the WHO and UNICEF, the International Code of Marketing of Breast-Milk Substitutes under the WHO, the U.S. Department of Health and Human Services (DHHS) 2010 Healthy People, the U.S. Congress, State Legislatures, the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP), the U.S. Preventive Services Task Force, the Association of Women's Health, Obstetric, and

Neonatal Nurses, the American College of Nurse Midwives, the International Lactation Consultants Association, the La Leche League, and other groups and initiatives continue to make efforts to protect, support, and promote breastfeeding. The financial, social, and health costs of not breastfeeding are more and more evident. A mother's decision to go back to work and employer lactation support will often determine whether or not a mother continues to breastfeed (Frick, Milligan, White, Serwint, & Pugh, 2005; U.S. Government Accountability Office, 2006a, 2006b; Garner, 2008; Kent, 2006; Riordan, 2005; Uriell et al., 2009). Efforts should continue to effect policies and decisions that increase lactation behavior and spaces that are conducive to breastfeeding in the workplace, especially for non-salaried workers. Legislation at the national, state, and community level that protects breastfeeding needs to continue. Medical and nursing support is critical to the success of breastfeeding for all mothers (Frick et al., 2005; Garner, 2008; Kogan, Singh, Dee, Belanoff, & Grummer-Strawn, 2008).

More states continue to pass legislation protecting breastfeeding mothers in public and supporting working mothers. However, states need to have dedicated individuals who protect, support, and promote breastfeeding at a state level. State wide coalitions also need to be developed to support community breastfeeding leaders (Centers for Disease Control & Prevention, 2008; Kogan et al., 2008). Additionally, federal funding that has a direct impact on the goals of Healthy People 2010 could have a significant impact on increasing breastfeeding initiation and duration rates for all groups of mothers (Brown et al., 2003).

Nursing/Provider Education. Mothers in this study pointed out that knowledge and support from providers, including lactation consultants, and physicians, helped them

to continue breastfeeding. Clear, accurate, and consistent information that increases mother confidence and is mother/patient/family centered within their cultural context cannot be underestimated especially for this group of mothers. Even though the group of mothers with diabetes indicated they had more breastfeeding experience, they may need more intense support. Recent emphasis on communicating the harm of formula for real informed consent regarding supplementation would support not only the mothers in this study, but all mothers (Cattanio, 2008; Gillis & Sigman-Grant, 2010; Heinig et al., 2009; Mantha et al., 2008; McInnes & Chambers, 2008; Miller et al., 2007; Nelson, 2007; Rosen et al., 2008; Wilkerson et al., 2010). Heinig et al. (2009), as opposed to Cattanio (2008) however, suggested that caution be used in giving information about the harm of formula feeding, particularly for mothers who feel they have no choice but to use formula.

Hopefully the results of this study will add to the influence in the development of a curriculum in medical and nursing programs that increases knowledge, skills, and attitudes of providers in providing effective, ethical, and cultural care in breastfeeding. Those programs then need to be evaluated and their effectiveness researched. Public programs that educate as early as kindergarten or primary grades would greatly increase understanding and acceptance of breastfeeding as the norm rather that bottle feeding (Bottaro & Guigliani, 2009; Bunik et al., 2006; Gillis & Sigman-Grant, 2010; Heinig et al., 2009; Mantha et al., 2008; McInnes & Chambers, 2008; Miller et al., 2007; Nelson, 2007; Rosen et al., 2008; Wilkerson et al., 2010).

Cross-cultural education should be made part of their curricula. Understanding how culture and social factors influence health behavior would help providers obtain,

negotiate and provide information for better clinical management. Three conceptual approaches identified in cross-cultural education should include focusing on attitudes, knowledge, and skills

Nursing Practice. Health care practices that protect, support, and promote optimal breastfeeding within the hospital and community setting needs to continue for the mothers in this study and all mothers. Breastfeeding protection, support, and promotion needs to occur throughout the pregnancy and should involve all providers who are in a position to give information, support, and care about this phenomenon.

Mothers in this study may have benefited from having provider information about the benefits of breastfeeding due to their chronic illness before they were pregnant or delivered. Interventions, including information, should begin well before delivery and continue after hospital discharge into the community targeting support groups, family support groups, information/education groups, one on one support/information, technology and using evidence based practice (Ball, 2009; Chung, Ramam, Trikalinos, Lau, & Ip, 2008; Cricco-Lizza, 2009; Declercq et al.; 2009; Dowling et al., 2009; Geraghty et al., 2008; Godfrey & Meyers, 2009; Graffy & Taylor, 2005; Hannula et al., 2008; Mickens et al., 2009; Murray et al., 2007; Spatz, 2006; Tiedje, 2005, U.S. Prevention Services Task Force, 2008).

Having had a cesarean delivery has been identified as a barrier for initiation and continuation of breastfeeding due to pain, delay in breastfeeding initiation, and separation from their babies (Chalmers et al., 2009; Karlström et al., 2007). In this study the greater majority of the participants experienced a Cesarean delivery. The population that it most negatively affected in terms of breast feeding was the diabetic subgroup. This group may

need greater support and information about maintaining health care across a continuum. This has been supported in the literature and these findings were related to the longer length of time for first feed, shorter length of breastfeeding compared to the other groups, and more negative attitudes toward breastfeeding. Nurses may consider raising the question of whether so many cesarean deliveries are medically indicated and if mothers are acting with true informed consent. Fries (2010) has suggested an ongoing commitment to decreasing cesarean deliveries and viewing births as a normal but significant life event.

Delivery in a Baby Friendly Hospital with access to lactation consultants and without formula supplementation/distribution can be one of the most powerful predictors of breastfeeding success (Declercq et al., 2009; Hannula et al., 2008; Merewood et al., 2005; Haas et al., 2006; Heinig, 2010; Rosenberg et al., 2008). It is not known if mothers in this study delivered in a Baby Friendly Hospital or if their baby needed to be in an NICU. However, following the ten steps and with greater efforts on the part of NICU nurses and physicians to support breastfeeding would be beneficial to all mothers and babies (Cricco-Lizza, 2009; Declercq et al., 2009; Godfrey & Meyers, 2009; Hannula et al., 2008; Merewood et al., 2005; Grummer-Strawn & Shaely, 2009; Heinig, 2010; Rosenberg et al., 2008). Mothers in this study and those identified by Dowling et al. (2009), and Miracle et al. (2004), indicated that the health of their baby was the primary reason for breastfeeding even with multiple challenges. Some of the insights from this study may support the development of more baby-friendly hospital environments so as to promote, protect, and support breastfeeding.

Future Research

Attention needs to be given to exploring issues surrounding the lack of support for breastfeeding in the WIC program. Minority mothers may often bare the double burden of experiencing a chronic illness, sometimes 2 or 3, while also participating in the WIC program. Are the low rates of breastfeeding in WIC a socioeconomic problem, due to a lack of funds for education, or perhaps a cultural insensitivity problem? Dowling et al. (2009) and Mickens et al. (2009) have found mothers' intentions can be shaped or changed over time especially in response to the needs of a vulnerable infant regardless of ethnicity or race. In this country nearly 50% of infants participate in the WIC program. Participation in WIC continues to be the greatest predictor for not initiating or continuing to breastfeed.

There is reason to believe that delivery in baby friendly hospitals that follow the ten steps to successful breastfeeding may decrease some of the disparities in breastfeeding for minority mothers who also experience the greatest burden of chronic illness and practices that decrease breastfeeding. Research that targets participants in WIC programs and a comparison of baby friendly and those not designated as baby friendly hospitals would add to the knowledge of what really works for mothers with chronic illness, regardless of demographic issues.

A better understanding of how asthmatic, hypertensive, and diabetic mothers can be supported in overcoming challenges to breastfeed within the context of their chronic health conditions and culture may help health care providers to continue the development of more appropriate interventions to support and increase initiation and duration rates.

The implications for this growing population could have significant consequences on their breastfeeding experiences and health, and that of society.

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Appendix A

Breastfeeding Attrition Prediction Tool

J. R. Janke

PLEASE CIRCLE THE NUMBER THAT MOST CLOSELY DESCRIBES HOW YOU FEEL ABOUT EACH STATEMENT.

	Strongly Agree					**Strongly disagree**
1. Breastfeeding is more convenient than formula feeding.	1	2	3	4	5	6
2. Breastfeeding is painful.	1	2	3	4	5	6
3. Formula feeding allows the mother more freedom.	1	2	3	4	5	6
4. Infant formula can cause allergies.	1	2	3	4	5	6
5. Breastmilk is healthy for the baby.	1	2	3	4	5	6
6. No one else can help feed the baby when you breastfeed.	1	2	3	4	5	6
7. It is difficult to breastfeed in public.	1	2	3	4	5	6
8. Formula fed babies tend to get sick.	1	2	3	4	5	6
9. Breastmilk is more nutritious than infant formula.	1	2	3	4	5	6
10. Breastfeeding makes your breasts sag.	1	2	3	4	5	6
11. Formula feeding is easier than breastfeeding.	1	2	3	4	5	6
12. Formula fed babies are more fussy than breastfed babies.	1	2	3	4	5	6
13. Breastfeeding makes you closer to your baby.	1	2	3	4	5	6
14. Breastfeeding makes returning to work difficult.	1	2	3	4	5	6
15. Formula fed babies are easier to satisfy than breastfed babies.	1	2	3	4	5	6
16. Formula fed babies tend to be overweight.	1	2	3	4	5	6
17. Breastfeeding is more economical than formula feeding.	1	2	3	4	5	6
18. When you breastfeed you never know if the baby is getting enough milk.	1	2	3	4	5	6
19. Mothers who formula feed get more rest than breastfeeding mothers.	1	2	3	4	5	6
20. Breastfeeding is natural.	1	2	3	4	5	6
21. Breastfeeding is more time consuming than formula feeding.	1	2	3	4	5	6
22. Formula feeding lets the father become close to the baby.	1	2	3	4	5	6
23. Infant formula can cause constipation.	1	2	3	4	5	6
24. Breastfeeding is best for the baby.	1	2	3	4	5	6
25. Breastfeeding is personally satisfying.	1	2	3	4	5	6
26. Breastfeeding is messy.	1	2	3	4	5	6
27. Breastfeeding ties you down.	1	2	3	4	5	6
28. Breastfeeding helps you bond with your baby.	1	2	3	4	5	6
29. Mothers who formula feed get back into shape sooner.	1	2	3	4	5	6

FOR EACH OF THE FOLLOWING INDIVIDUALS INDICATE HOW MUCH THEY WANT YOU TO BREASTFEED.

	Definitely Breastfeed					**Definitely NOT Breastfeed**	**Not Applicable**
30. The baby's father thinks I should:	1	2	3	4	5	6	0
31. My mother thinks I should:	1	2	3	4	5	6	0
32. My mother-in-law thinks I should:	1	2	3	4	5	6	0
33. My sister thinks I should:	1	2	3	4	5	6	0
34. My closest female friend thinks I should:	1	2	3	4	5	6	0
35. My doctor thinks I should:	1	2	3	4	5	6	0
36. My midwife thinks I should:	1	2	3	4	5	6	0
37. La Leche League thinks I should:	1	2	3	4	5	6	0
38. The hospital thinks I should:	1	2	3	4	5	6	0
39. My baby's doctor thinks I should:	1	2	3	4	5	6	0
40. My childbirth educator thinks I should:	1	2	3	4	5	6	0
41. Other relatives think I should:	1	2	3	4	5	6	0
42. People who are important to me think I should:	1	2	3	4	5	6	0

PLEASE INDICATE BELOW HOW IMPORTANT EACH OF THE FOLLOWING STATEMENTS ARE TO YOU.

	Important to me					**Not important to me**
43. Using a feeding method that is convenient is:	1	2	3	4	5	6
44. Using a feeding method that doesn't cause me pain is:	1	2	3	4	5	6
45. Using a feeding method that lets me have some freedom is:	1	2	3	4	5	6
46. Using a feeding method that won't cause allergies is:	1	2	3	4	5	6
47. Using a feeding method that is healthy for my baby is:	1	2	3	4	5	6
48. Using a feeding method that lets someone else feed my baby is:	1	2	3	4	5	6
49. Using a feeding method that is easy to do in public is:	1	2	3	4	5	6
50. Using a feeding method that protects my baby from getting sick is:	1	2	3	4	5	6
51. Using a feeding method that is nutritious is:	1	2	3	4	5	6
52. Using a feeding method that won't make my breasts sag:	1	2	3	4	5	6
53. Using a feeding method that is easy is:	1	2	3	4	5	6
54. Using a feeding method that keeps my baby from being fussy is:	1	2	3	4	5	6
55. Using a feeding method that lets me be close to my baby is:	1	2	3	4	5	6
56. Using a feeding method that makes it easy to return to work is:	1	2	3	4	5	6
57. Using a feeding method that satisfies my baby is:	1	2	3	4	5	6
58. Using a feeding method that keeps my baby from being overweight is:	1	2	3	4	5	6
59. Using a feeding method that is economical is:	1	2	3	4	5	6
60. Using a feeding method where I know the baby is getting enough is:	1	2	3	4	5	6
61. Using a feeding method that lets me get lots of rest is:	1	2	3	4	5	6
62. Using a feeding method that is natural is:	1	2	3	4	5	6

63. Using a feeding method that saves time is:	1	2	3	4	5	6
64. Using a feeding method that lets the father be close to the baby is:	1	2	3	4	5	6
65. Using a feeding method that doesn't cause constipation is:	1	2	3	4	5	6
66. Using a feeding method that is best for my baby is:	1	2	3	4	5	6
67. Using a feeding method that is personally satisfying is:	1	2	3	4	5	6
68. Using a feeding method that is not messy is:	1	2	3	4	5	6
69. Using a feeding method that doesn't tie me down is:	1	2	3	4	5	6
70. Using a feeding method that helps me bond with my baby is:	1	2	3	4	5	6
71. Using a feeding method that lets me get back into shape is:	1	2	3	4	5	6

HOW MUCH DO YOU CARE ABOUT THE FOLLOWING PEOPLES OPINION ON HOW YOU SHOULD FEED YOUR BABY?

	Do not care at all					**Care very much**	**Not Applicable**
72. The baby's father	1	2	3	4	5	6	0
73. Your mother	1	2	3	4	5	6	0
74. Your mother-in-law	1	2	3	4	5	6	0
75. Your sister	1	2	3	4	5	6	0
76. Your closest female friend	1	2	3	4	5	6	0
77. Your doctor	1	2	3	4	5	6	0
78. Your midwife	1	2	3	4	5	6	0
79. La Leche League	1	2	3	4	5	6	0
80. Your hospital nurse	1	2	3	4	5	6	0
81. Your baby's doctor	1	2	3	4	5	6	0
82. Your childbirth educator	1	2	3	4	5	6	0
83. Other relatives	1	2	3	4	5	6	0
84. People who are important to you	1	2	3	4	5	6	0

PLEASE INDICATE THE DEGREE TO WHICH YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS.

	Strongly agree					**Strongly disagree**
85. I have the necessary skills to breastfeed	1	2	3	4	5	6
86. I am physically able to breastfeed	1	2	3	4	5	6
87. I know how to breastfeed	1	2	3	4	5	6
88. I am emotionally ready to breastfeed	1	2	3	4	5	6
89. I am determined to breastfeed	1	2	3	4	5	6
90. I won't need help to breastfeed	1	2	3	4	5	6
91. I have total control over my breastfeeding	1	2	3	4	5	6
92. Breastfeeding is easy	1	2	3	4	5	6
93. I am confident I can breastfeed	1	2	3	4	5	6
94. I know I will have enough milk for the baby	1	2	3	4	5	6

PLEASE CIRCLE THE CORRECT ANSWER OR FILL IN THE BLANKS FOR THE FOLLOWING QUESTIONS:

95. What is the PRIMARY method of infant feeding you are using with your new baby?
    a. Breastfeeding (**if circled, proceed to question #96**)
    b. Formula feeding (**if circled, skip to question #100**)

96. How long do you intend to breastfeed? _____

97. When did you decide you were going to breastfeed?
    a. Before you became pregnant
    b. During the first three months of your pregnancy (1st trimester)
    c. During the middle three months of your pregnancy (2nd trimester)
    d. During the last three months of your pregnancy (3rd trimester)
    e. After the baby was born.

98. How soon after the birth did you breastfed your infant? _____ (hours)

99. What was the main reason(s) you chose to breastfeed? (list as many reasons that apply)
    _____
    _____
    _____
    _____

100. What is the birthdate of your newborn: _____

101. What type of birth did you have?
    a. Vaginal birth
    b. Cesarean birth

102. How much did your baby weigh at birth? _____ pounds _____ ounces

103. What was your infant's sex? _____ male _____ female

104. Have you ever breastfed before?
    a. Yes (**if yes, proceed to question #105**)
    b. No (**if no, skip to question #107**)

105. How long did you breastfeed your last child? _____

106. Was the experience
    a. Extremely successful
    b. Very successful
    c. Moderately successful
    d. Slightly successful
    e. Not at all successful

107. How many children have you given birth to? _____

108. Your age: _____

109. Your ethnic origin:
   a. Black
   b. Asian
   c. White
   d. Hispanic
   e. Native American
   f. Other (please specify): _____

110. Circle the highest grade completed:

Grade school:	5	6	7	8
High school:	9	10	11	12
College:	13	14	15	16
Graduate school:	17	18	19	20

111. Annual family income:
   a. $10,000 or less
   b. $10,001 to $25,000
   c. $25,001 to $40,000
   d. $40,001 to $55,000
   e. $55,001 to $70,000
   f. $70,001 to $85,000
   g. $85,001 to $100,000
   h. Over $100,000

112. Marital status: _____

113. Who is YOUR primary health care provider?
   a. Nurse midwife
   b. Obstetrician
   c. Family practice physician
   d. Other (please specify) _____

114. Who is the BABY'S primary health care provider?
   a. Nurse practitioner
   b. Pediatrician
   c. Family practice physician
   d. Other (please specify) _____

Health and Psychosocial Instruments
(HaPI)

Breastfeeding Attrition Prediction Tool

J. R. Janke

Acronym

BAPT.

Primary Source

Janke, J. R. (1994). Development of the Breastfeeding Attrition Prediction Tool. Nursing Research, 43, 100-104.

Purpose Statement

Breastfeeding Attrition Prediction Tool (BAPT) is guided in its item development by the TPB [Theory of Planned Behavior] theoretical definitions for attitude, subjective norm, and control for each construct (Ajzen, 1988). A six-point summated rating scale is used for all items. According to the TPB, attitude is defined as beliefs concerning the consequences of a given behavior multiplied by the positive or negative evaluation of the consequences (Azjen). An example of how this is operational zed for the BAPT is to ask women how much they agree with the belief that 'breast-feeding is messy' and how important it is for them to 'use a feeding method that is not messy.' The product of the two scores provides the measure for the attitudinal item. Subjective norm is defined by the TPB as an individual's belief that a certain referent wants them to perform or not to perform a given behavior multiplied by the individual's self-reported motivation to comply with the given referent (Ajzen). An example of how this is operational zed is to ask subjects how much they agree with the belief that 'the baby's father thinks I should breastfeed.' The motivational component is measured by asking respondents 'How much do you care about the father's opinion on how you should feed the baby.' The product of the two scores provides the subjective norm item measure. The TPB theoretically defines the control construct as perceptions of having control over internal constraints believed to interfere with performing a behavior under limited volitional control. The control construct is assumed to reflect past experiences as well as anticipated obstacles and impediments (Azjen). An item example from this scale is the extent to which a woman agrees with the statement 'I am confident I can breast-feed'....[The BAPT] has 52 items, including 29 attitudinal items, 10 control items, and 12 subjective norm items. It also includes the motivation to comply and the evaluation components of the subjective norm and attitudinal items" (p. 101).

Reliability

Reliability statistics are not easily identified in the source.

Number of Questions

52.

Directions for Scoring

See below

Reference

Ajzen, I. (1988). Attitudes, personality, and behavior. Chicago, IL: Dorsey Press.

Appendix B

Scoring Guidelines: Breastfeeding Attrition Prediction Tool

ATTITUDINAL FACTORS

a. Negative Breastfeeding Sentiment (NBS) Attitudinal Scale

   i. Multiply each belief score by its corresponding outcome evaluation. The items to be multiplied are as follows: 2,44; 3,45; 6,48; 7,49; 10,52; 11,53; 14,56; 15,57;
   18,60; 19,61; 21,63; 22,64; 26,68; 27,69; 29,71.

      (1) Example: a person scores a 6 for item 2 "Breastfeeding is painful" and a 4 for
      item 44 "Using a feeding method that doesn't cause me pain is...". These scores are multiplied for an item attitudinal score of 24.

   ii. Sum all multiplied scores for the "Negative Breastfeeding Sentiment" attitudinal score.

   iii. The higher the score, the greater the negative breastfeeding instrument.

b. Positive Breastfeeding Sentiment (NBS) Attitudinal Scale

   i. Multiply each belief score by its corresponding outcome evaluation. The items to
   be multiplied are as follows: 1,43; 4,46; 5,47; 8,50; 9,51; 12,54; 13,55; 16,58; 17,59; 20,62; 23,65; 24,66; 25,67; 28,70.

      (1) Example: a person scores a 2 for item 5 "Breast milk is healthy for the baby" and a 6 for item 47 "Using a feeding method that is healthy for my baby is...". These scores are multiplied for an item attitudinal score of 12.

   iv. Sum all multiplied scores for the "Positive Breastfeeding Sentiment" attitudinal score.

   v. The lower the score, the greater the positive breastfeeding instrument.

SOCIAL AND PROFESSIONAL SUPPORT SCALE (SPS)

a. Multiply each belief statement by its corresponding motivation to comply statement. The items to be multiplied are as follows: 30, 72; 31, 73; 32, 74; 33, 75; 34, 76; 35, 77; 36, 78; 37, 79; 38, 80; 39, 81; 40, 82; 41, 83; 42, 84

b. Sum all multiplied scores for the "Social Support" scale.

c. The higher the score, the greater the support for breastfeeding.

BREASTFEEDING CONTROL SCALE (BFS)

a. Sum scores for items 85-94.

b. The lower the score, the greater sense of control the woman has over her ability to breastfeed.

Appendix C

Chronic Illness and Continuation/Attrition Form

1. What is your chronic illness?
   a. Asthma
   b. Hypertension
   c. Diabetes

2. What most affected your decision to continue and/or to stop breastfeeding?

_____
_____
_____
_____
_____

Appendix D

Breastfeeding and Mothers with Chronic Health Conditions

Introduction

Blanche Landis is a doctoral student in nursing at the Hahn School of Nursing and Health Science at the University of San Diego. You are invited to participate in a dissertation study she is conducting for the purpose of exploring how mothers with chronic health conditions like asthma, hypertension or, diabetes make decisions about starting- and continuing- to breastfeed their babies.

Procedures

The research project will involve a meeting with Blanche that will take about 30 minutes. This meeting will take place at a location that is convenient to you, including your home or a local café. At this meeting, Blanche will ask you to fill out a questionnaire and a short form. The questionnaire and short form will ask you about breastfeeding, including how you feel about breastfeeding and how other people in your life feel about it. A typical question on this questionnaire is, "How important is using a feeding method that is convenient to you?" You will also be asked general questions about yourself such as age, income, and the type of chronic illnesses you might have. The project will also use the internet. If you are interested you may contact Blanche and she will email or mail the forms to be emailed or mailed back to her. You should keep a copy of the consent form emailed or mailed to you.

Risks

There may be a risk that you may feel tired or fatigued while filling out the questionnaire. You can stop at any time to rest, decide not to fill out all the forms, or withdraw from the study anytime.

Sometimes when people are asked to think about their feelings, especially feelings about things like feeding their babies, they feel sad or anxious. If you would like to talk to someone about your feelings at any time, you can call toll-free 24 hours a day:

San Diego Mental Health Hotline at 1-800-479-3339

Benefits

The benefit to participating will be in knowing that you helped nurses and healthcare providers know more about how to help moms with chronic illnesses who breastfeed their babies.

Participant Costs and Payment

The only cost to you is 30 minutes of your time. You will receive a $25 Target gift card for participating in the research project. Blanche will give you the gift card even if you start the meeting with her and decide not to finish it, or decide to withdraw from the study completely.

Confidentiality

Any information provided and/or identifying records will remain confidential and safeguarded in a locked file in Blanche Landis's home for a minimum of five years. All data collected from you will be coded with a number and not your name. The results of the research project may be made public and information quoted in professional journals or meetings, but information from this study will only be reported as a group, and not individually.

Voluntary Participation and Withdrawal

Participation in the research project is entirely voluntary and you can refuse to answer any question and/or quit at any time. Should you choose to quit, no one will be upset with you. Blanche will still give you the $10.00 gift card. Deciding not to participate or answer some of the questions will have no effect on your health care or any other services you might receive from doctors, nurses, or social services.

More Information

If you have any additional questions about this research project, please contact Blanche Landis at (619) 692-0603 or e-mail her at blandis@mail.sdsu.edu. You may also contact Dr. Anita Hunter, the professor who is supervising Blanche's research, at the University of San Diego School of Nursing (619) 260-4548 or email her at ahunter@sandiego.edu for additional information.

I have read and understand this form, and consent to the research it describes to me. I have received a copy of this consent form for my records.

Signature of Participant Date

Name of Participant (Printed)

Signature of Investigator Date

Appendix E

ARE YOU A MOTHER WHO HAS ASTHMA, HYPERTENSION, OR DIABETES AND HAS EVER BREASTFED OR WANTED TO BREASTFEED IN THE PAST 3 YEARS?

You are invited to share your experiences in a study

Sharing your experiences of breastfeeding with a history of asthma, hypertension, or diabetes may help nurses to learn how to better support other mothers with chronic illness to breastfeed

A graduate researcher from the University of San Diego is looking for women who have asthma, hypertension, or diabetes (before the pregnancy) to participate in this study by filling out a questionnaire and a short form. It will take about 30 minutes of your time.

If you are over 18 years of age, English speaking and want to discuss the study

Please contact

Blanche Landis PhDc, RN
(619) 692-0603 or email blandis@mail.sdsu.edu

You will be given a $25.00 Target gift card for participating